TOWNS, WHEELS OR WINGS?
FOR RESOURCE DEVELOPMENT

SELECTED CONFERENCE PAPERS

From the conference held February 3-4, 1986
in Vancouver, British Columbia organized by the

Western Resources Program

of

The Institute for Research on Public Policy

December, 1986

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PREFACE

"Towns, Wheels or Wings? for Resource Development" was the theme of a two-day conference in Vancouver, February 3-4, 1986 organized by the Western Resources Program of the Institute for Research on Public Policy. The conference was designed to illuminate the various factors involved in the threefold choice between building new towns, short distance (wheels) commuting by workers, or long distance (wings) commuting, as the means for the development of natural resources, especially in western Canada and the north.

The "towns" option has two elements: the **creation** of a town, such as Tumbler Ridge in northeastern British Columbia, to facilitate a large-scale resource development (in that case, coal) or, more commonly lately, the **threat of abandonment** of such towns in the face of declining markets or depletion of the resource. Among the commuting options, quite a variety of operations have been tried involving buses, helicopters and jet aircraft for transporting workers across distances that range from an hour's drive from settlements in the vicinity of resource sites to long-haul passenger flights from cities in southern Canada to mines, offshore drilling rigs and supply ships in the North.

The explicit choice between towns, wheels or wings is increasingly recognized by decision makers in government and the resource industry but it had not been the focus of general examination or wide public debate prior to the Institute's conference. Yet in Canada's current economic situation, with the strong need to minimize resource production costs and to maintain or enhance international competitiveness, the choice is more than a matter of individual corporate strategy; it is of vital public interest

with profound implications for the future of the resource sector in the western region and throughout Canada. Not all of the determining factors are financial, of course. There are important social and cultural considerations, technical constraints and political imperatives.

The conference attracted senior managers in resource companies with responsibilities for corporate planning, human resources and community relations. Equally, it commanded the attention of provincial, territorial and federal government officials from a variety of departments whose policies affect—or, in turn, could be affected by—the "towns, wheels or wings?" decision. In addition, academics with related research interests, resource industry associations, labour unions, municipalities, regional planners and engineering firms found this topic relevant.

If the proceedings of the conference can be distilled, evidently the preferred choice for resource development today is wheels or wings, not towns. Short and long-distance commuting by workers has, bucking the Canadian tradition, replaced the new town as the means for natural resource development, in western Canada and the North. Tumbler Ridge, built to support the Northeast coal development in B.C., may have been the last new tailormade resource town.

This decided shift in approach has occurred without fanfare and, hitherto, without an airing of the possible broader implications. The impetus seemingly has come, in different instances, from both individual resource companies and from provincial governments, and the decisive factors have been economic as well as social, political and cultural. Whether commuting is simply "trendy" is a question that probably cannot be answered before all the phases of these respective cycles have been experienced. In the meantime there is considerable dispute over the matter of whether the turn to commuting is good or bad. It emerges as a highly debatable issue of public policy and one that merits further study. Potentially, the choice has important ramifications for Canada's success as a competitive exporter of resource products.

Owing to the emphasis that was placed on "wheels or wings" at the conference and the fact, revealed by our annotated bibliography on the subject published earlier, that a gap in the literature exists on these options, the papers in this volume were selected in the main to relate to commuting rather than resource towns.

Barbara L. Hodgins
Director, Western Resources Program
December, 1986

THE INSTITUTE FOR RESEARCH ON PUBLIC POLICY

CONFERENCE PROGRAM

"TOWNS, WHEELS OR WINGS? FOR RESOURCE DEVELOPMENT"

Holiday Inn Harbourside, Vancouver
February 3-4, 1986

Monday - February 3, 1986:

8:00	-	9:00 a.m.	Registration
9:00	-	9:10 a.m.	Introductory Remarks
9:10	-	10:15 a.m.	Keynote Address: **"TOWNS, WHEELS OR WINGS? FOR RESOURCE DEVELOPMENT — THE SPECTRUM OF FACTORS AFFECTING THE CHOICE"** **DON DETOMASI,** Dean, Faculty of Environmental Design, The University of Calgary Discussant: **DENIS DEPAPE,** Consultant, InterGroup Consultants Ltd. Moderator: **PETER OBERLANDER,** Director, Centre for Human Settlements, and Professor, School of Community & Regional Planning, University of British Columbia
10:15	-	10:30 a.m.	Coffee Break
10:30	-	Noon	Panel Discussion: **"WHAT'S NEW IN RESOURCE TOWNS?"** **GARY HARKNESS,** Assistant Deputy Minister, Planning and Development, Ministry of Municipal Affairs, Government of British Columbia -- with focus on Tumbler Ridge **DAVID STUART,** Manager, Social Affairs, Canstar Oil Sands Ltd. -- with reference to Fort McMurray **PETER C. WALLIS,** Vice-President, Law and Government Relations, Pacific Western Airlines -- on airline services to resource towns Moderator: **BRAHM WIESMAN,** Professor and Director, School of Community and Regional Planning, University of British Columbia

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"TOWNS, WHEELS OR WINGS? FOR RESOURCE DEVELOPMENT"

Noon	Luncheon Address: **NICK POUSHINSKY**, Secretary to the Social Resources Committee of Cabinet, Government of Manitoba, on "Towns, Wheels or Wings? a View From the Cabinet Office"
	Introduction: **ROD DOBELL**, President, The Institute for Research on Public Policy
2:00 - 3:30 p.m.	Panel Discussion: **"EXISTING RESOURCE TOWNS IN JEOPARDY — WHAT CAN BE DONE? WHAT SHOULD BE DONE?"**
	NEIL FAULKNER, Assistant Deputy Minister, Indian Affairs and Northern Development, Government of Canada -- on the story of Faro
	DENNIS YOUNG, President of the Canadian Association of Threatened Single Industry Towns -- with suggested solutions
	ROBERT KEYES, Director, Human Affairs Division, Mineral Policy Sector, Energy, Mines and Resources Canada -- on new financial mechanisms for addressing mining community problems
	Moderator: **STEVEN HOLLETT**, Director, Economic and Industrial Development Branch, Ministry of Industry, Government of British Columbia -- with references to the prolonged efforts to save the town of Ocean Falls.
3:30 - 4:00 p.m.	Coffee Break
4:00 - 5:15 p.m.	Concurrent Workshops
	A. **"WORKERS' DEPENDENTS IN RESOURCE TOWNS"**
	DIANA ELLIS, Consultant, Women's Issues and Organizing Skills Associate, Women's Research Centre Vancouver — on the experience and problems in the 1970's and update from the Hemlo gold rush
	National Film Board production, "No Life For A Woman", will be shown
	B. **"FAMILY ADAPTATION TO OFFSHORE COMMUTING BY OIL AND GAS WORKERS IN NEWFOUNDLAND"**
	MARK SHRIMPTON, Director, Research Unit, Community Services Council of Newfoundland and Labrador — recent research findings and policy implications

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5:30 - 6:30 p.m.	Optional -- for the convenience of delegates, the controversial film, **"MEGADREAM"**, National Film Board production on the Northeast Coal Development in B.C., will be shown
7:00 p.m.	Reception
7:30 p.m.	Dinner Address: **ROY E. LLOYD**, President, Saskatchewan Mining Development Corporation
	Introduction: **GARNET PAGE**, O.C., President, Garnet T. Page Consulting Limited
9:30 p.m.	Adjournment

Tuesday - February 4, 1986:

9:00 - 10:15 a.m.	Panel Discussion: **"INDUSTRY ASSESSES THE COMMUTING OPTIONS"**
	FRED NOGAS, Human Resources Specialist, Engram Industries Limited (formerly with Gulf Minerals) -- about Rabbit Lake
	HANK GIEGERICH, President and General Manager, Cominco Alaska, Inc. -- on Polaris and now Red Dog
	LARRY BERG, Vice-President, Human Resources, Luscar Ltd. -- about the shift from a planned new town to use of helicopters and now buses at Sterco
	JOHN BATTEKE, Manager, Socio-Economic Affairs, Esso Resources Canada Ltd. -- covering the company's varied experience
	Moderator: **ROD DOUGLAS**, Chairman of the Board, Pine Point Mines Ltd.
10:15 - 10:30 a.m.	Coffee Break
10:30 - 11:00 a.m.	Question Period (foregoing panel)
11:00 - Noon	Plenary Session: **"HOW THE CHOICE BETWEEN TOWNS, WHEELS OR WINGS AFFECTS EMPLOYMENT OF NATIVE PEOPLES"**
	Moderator: **JAMES COONEY**, Manager, Government Affairs, Placer Development Ltd.
	CHARLES W. HOBART, Professor of Sociology, Department of Sociology, University of Alberta

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"TOWNS, WHEELS OR WINGS? FOR RESOURCE DEVELOPMENT"

Noon - 1:45 p.m.	Luncheon Address: **ART PHILLIPS,** Commissioner of Critical Industries, British Columbia
	Introduction: **TEX ENEMARK,** President of the Mining Association of British Columbia
2:00 - 3:30 p.m.	Panel Discussion: **"INTERNATIONAL EXPERIENCE WITH THE TOWNS, WHEELS OR WINGS CHOICE"**
	PETER W. NEWTON, Principal Research Scientist, Commonwealth Scientific and Industrial Research Organization, Australia
	KRISTI BRANCH, Research Scientist, Battelle (Seattle) -- on the United States experience
	Moderator: **J. DOUGLAS PORTEOUS,** Professor, Department of Georgraphy, University of Victoria -- with added commentary on Chile
3:45 - 4:30 p.m.	Rapporteur
	HONOURABLE JUDITH EROLA, P.C., Consultant, and former federal Minister of State (Mines)
	Introduction: **HAROLD FARGEY,** Retired Executive Vice President, Cominco Ltd. and former President of the Mining Association of Canada

TOWNS, WHEELS OR WINGS? FOR RESOURCE DEVELOPMENT: FACTORS AFFECTING THE CHOICE

DON DETOMASI

The theme of this conference calls for an investigation and discussion of a wide range of issues respecting the choice between work force commuting and the creation of new towns for resource development in Canada. Although resource development and the settlement options which are associated with it tend to be thought of as questions of particular significance to western and northern Canada, nevertheless they are questions of truly national scope and significance. While venue and origins of many of the participants at this conference give it a decidedly western flair, we should all bear in mind the fact that the history of the entire nation has been written largely in terms of resource development, and the issues which we shall be discussing at this conference are significant to eastern Canada, the maritime provinces and Newfoundland.

The issues which are summarized in the conference theme, "Towns, Wheels or Wings? for Resource Development", have been cast in terms of three specific choices in new resource development; namely, two forms of commuting and the creation of new towns.

First, the commute over a short-distance or time using "wheels" or, indeed, "rails", implies that commuting occurs on a daily or, at the longest, a work-week basis. This choice also suggests an approach to resource development in which employees, their families and derivative new populations are based mainly in an existing regional centre which is geographically close to some major resource development project. The social, economic, political and, perhaps, environmental consequences of a resource development of this type tend to be concentrated spatially and felt most acutely in existing regional centres.

The alternative form of commuting in resource development involves a long-distance commute, characterized as the "wings" option, wherein persons employed in resource projects live during working periods in some type of work camp at the project site and commute to and from that site on a relatively infrequent basis,

e.g. three weeks in and two weeks out. The long distance commuting option typically involves employees who come from a variety of geographically dispersed home bases, in many cases national or even international in location. This option clearly diffuses the specific community impacts of the resource development across a relatively greater number of towns and cities. Because of this, specific community impacts are minimal and seldom require a policy response.

A third possibility which has been used to support resource development is the creation of a new town. This alternative may be, or may once have been, particularly attractive in the exploitation of resources in remote locations far from the existing settlements and in conditions not conducive to long distance commuting. It does, however, introduce into the economic calculus of resource development a new set of benefit and cost elements which, as we shall see, have changed dramatically through time. The evolution of our knowledge of and thinking about new town creation, and changes in the policy environment, have fundamentally altered the historical risk-sharing arrangements among resource developers, workers and government. The mixed development of contemporary new towns, such as Tumbler Ridge in British Columbia, involve far more risk-sharing between the public and private sectors than the historical resource town and both of these, in turn, differ from the arrangements which exist in long-distance commuting. In the latter case, public investments and risk exposure are generally minimal.

This conference has been organized, at least partly, in response to the fact that the major factors which have historically been considered in making the choice between towns, wheels or wings have become increasingly numerous and more complex as our historical experience with resource development has evolved. Thus, decisions themselves and the allocation of decision-making responsibility are not as clearcut as perhaps they once were.

In what now must be regarded by industry as "the good old days", resource development in Canada and decisions respecting community developments, including the possibility of a commuting work force, were largely the purview of the private firm spearheading the particular project. The resource development and settlement decisions taken by private sector actors were arrived at in the context of an essentially unregulated, although not completely free, market system. These private decisions were essentially unconstrained by public policy concerns. In this now distant era, private firms were primarily concerned with minimizing their (private) costs of resource development and production. The location of economic activity, based on resource extraction and production, and the settlement choices which resulted from such location decisions, were derived almost exclusively from an analysis of the private costs of production and distribution. Because of the highly competitive nature of the international markets which characterize most natural resources, cost minimizing behaviour is essential. Further, because transportation technology and infrastructure did not readily facilitate the kinds of commuting options which are commonplace today, the settlement option chosen in resource development was frequently the new, or "instant" town and, in many cases, these were company towns in their purest form.

We have come a long way since the days of the relatively unregulated market system and the company town settlement which this so often implied. During this time, there have been two important general developments which have fundamentally changed the environment within which resource development decisions are made and

that have led to a significant increase in the range of factors which must be formally incorporated into such decisions. I would suggest that, at the present time, there is a third set of forces at work which may also have important implications for the settlement choices that flow from resource development decisions. In brief, the two historical and one contemporary development to which I refer are: first, the problems inherent in the company town solution to the settlement question; second, the emergence of a range of public policy interventions which both directly and indirectly alter the private sector decision-making environment; and, third, the most recent of those interventions is the contemporary debate over free or freer trade between the United States and Canada. The first two of these developments underlie the emergence of most of the important issues on which this conference is focused and I shall organize my comments in terms of these. I will conclude with a few additional comments about the free trade question.

Historical Problems With Company Towns and New Resource Towns

There have been a number of problems inherent in the creation of the new town/company town in resource development, which have increasingly required private sector decision-makers to rethink the choices and trade-offs between the new town vs. existing centre vs. long distance commuting options in resource development. These particular problems are well known and have been extensively investigated and written about by academics, civil servants, private consultants and, indeed, representatives of industry itself. They form part of the subject matter of this conference and need only briefly be cited here:

There are the economic facts of single industry towns: the lack of diversity in the community economic base; the derivative problems of cycles of boom and bust; cyclical or seasonal instability in employment and income; the lack of alternative employment opportunities: the fact of a limited or highly problematic lifetime and the associated problems of shutdown, decommissioning and the death of a community. The prospect of "abandonment" is clearly an important factor in the town vs. commuting discussion; contemporary examples, such as Uranium City, Ocean Falls and Pine Point, remind us of the limited lifetimes which some resource towns may face. The implications of the Quintet mine write-down, for Tumbler Ridge and the surrounding region, is an issue of contemporary importance here in British Columbia.

Moreover, such towns may afford an inadequate and atrophied development of community in the broadest sense of the term:

- physical: problems of housing; the availability, or lack thereof, of alternatives, questions of housing suitability and quality; inadequate physical infrastructure; and, more generally, poor environmental quality.

- social: nonexistent or inadequate social and cultural facilities and services, often limited by what the "Company" is willing to provide; a rigid social class system, based on occupation and employment status within the Company etc.;

- political: either nonexistent or peculiar forms of local government; lack of opportunity for employees to participate meaningfully in community governance and, otherwise, in decision-making in areas of community concern;

Furthermore, there are the effects on employee morale; the high rates of employee turnover and associated population instability, which are related to the problems previously listed and which bear directly on the ability of the firm to maintain a competitive cost position.

Finally, and of more recent importance, has been the lack of social, cultural and, most critically, employment opportunities for minorities in the community, particularly women, the young and, through time, the elderly—in many cases, have been unable to retain housing in this kind of community once they have retired.

It is clear that the above problems and other deficiencies which are inherent in the single industry, company town form of development have, among other things, adversely affected the ability of industry to attract and maintain the high quality labour force and population needed in order to remain competitive. For decades, industry itself has recognized that the social, political and second order costs of the company town may have negated the pure private cost-minimizing strategy historically pursued, and has created the need to consider alternative solutions to the settlement question.

Public Policy Interventions

The second major historical development which has influenced the choice between "towns, wheels or wings" for resource development has been the emergence of a wide range of public policy interventions into what hitherto had been largely market-based private sector decision-making environments. These public policy initiatives, that have come from all levels of government, have introduced a new set of variables and constraints, have generated a number of the issues to be addressed at this conference.

A number of government activities have fundamentally and directly altered the relevant historical comparative cost relationship -- so that even if purely private market-based decisions were still possible, which they are not, the answers to the trade off questions in commuting vs. settlements will now be different in new resource development projects. Examples of such activities are:

(a) public sector investment in transportation infrastructure; the construction of thousands of kilometres of roads and rails; the construction of airports, terminal and warehousing facilities and ports have fundamentally altered the private costs of various commuting options. Massive public investments in such infrastructure, when combined with changes in transportation technology, particularly air travel, have improved commuting possibilities and altered the economics of commuting;

(b) government programs, both federal and provincial, to provide or share the infrastructure costs of the community service; urban design and housing standards, regulations, servicing requirements etc. have all profoundly altered the economics of building a community. This, in turn, has altered the cost comparisons between the creation of a new town and an expansion of an existing centre as well as between these two options and long-distance commuting;

(c) direct financial support and incentives given by governments to individuals and groups -employees, small businesses etc. - involved in resource

development. Northern allowances, CMHC mortgage subsidies and assistance to housing cooperative groups, are examples of programs which are designed to enhance both employee satisfaction and community development and which make living in remote resource towns more attractive.

(d) in the last 20 years or so, major public sector concerns for community development, in its broadest sense, and for the quality of both socio-economic and biophysical environments have led to extensive regulations and to requirements for impact analysis in advance. Impact analysis requires developers and approving agencies to assess the social, economic, political and environmental consequences of a proposed resource development project for the communities, region and even the province in which it would occur. The results of these analyses may often determine whether development approval is given and will certainly generate a requirement for costly impact management and mitigation measures. Such analyses compel private sector decision-makers to consider more fully a much broader range of costs—that is, the social costs of their activities and not the purely private costs—in their analysis of commuting and alternative settlement options. A formal consideration of <u>all</u> of the costs associated with alternative choices frequently leads to a different choice from among them.

(e) public sector policies and programs of a pro-active or affirmative action type, which are designed primarily to extend employment opportunities and to reduce income inequities to selected minority groups. In the area of resource development, the most relevant policies, which have been both federal and provincial, are those addressed toward women and native peoples. In addition, however, provincial government policies related to preferential hiring practises for local and provincial residents are also relevant. I referred earlier to the lack of employment and other opportunities in company towns for women and the impact which this, in turn, has had on employee morale and turnover. A more general societal concern for increasing the opportunities of employment and advancement for women and, more recently native peoples, have resulted in public policies and programs, e.g. training, education, relocation programs and other manpower programs which have altered the operations of the labour markets most relevant to the processes of resource development. As a consequence, these initiatives have influenced the comparative costs and attractiveness of towns and commuting options.

By way of illustration, the work of Charles Hobart, another speaker at this conference, has reported that long-distance commuting has proven to be a viable means of implementing policies designed to provide elements of our native population with employment opportunities in resource development, while simultaneously permitting them to play traditional roles in their native communities.

The examples above deal wth a range of government activities which essentially direct and constrain private market-based solutions. That is to say, the decisions would frequently be different in the absence of such programs and policies.

However, perhaps more important than these sorts of public sector interventions has been the emergence of both provincial and federal government policies in two areas which directly affect the towns, wheels or wings question. I refer to public policies and programs which in many cases effectively preclude, not merely alter, a particular market-based private decision.

The first relates to public policies, primarily at the provincial level, aimed at resource management in the broadest sense, which define as a public responsibility the integrated management of both renewable and non-renewable resources. The notion of resource management as a public responsibility has led to the development of a wide range of direct controls, regulations and prohibitions designed to manage, in a systematic way, the process of resource development for economic, social and political reasons. Indeed, both federally and provincially, we have seen the emergence of whole ministries or departments which have been charged with the responsibility of managing and controlling the exploitation, development, processing, distribution, etc. of a specific resource or clearly defined kinds of resources, e.g. fisheries, forestry, energy and the like. The notion of public resource management in many cases removes decision making respecting resource development from the market place, placing it, instead, in the political and regulatory arena. Put differently, public resource management often effectively precludes decisions based on cost minimizing approaches.

Second, again both federally and provincially, governments have developed policies and a range of programs which focus on the problems of regional economic disparity and regional development. At both levels of government we have witnessed the creation of Departments of Regional Economic Development or the equivalent, whose programs have been designed to achieve particular social, economic and political objectives of governments in the rural areas and regions which have experienced persistent economic decline or which have never demonstrated economic growth. Natural resource development has always been and continues to be one of the major instruments which governments at both levels employ in their efforts to achieve their respective regional development policy objectives. In pursuit of these objectives, which often may be more political and social than economic, governments may require that specific kinds of resource development projects occur in specific places, on specific a scale or at specific times. Thus, the settlement vs. commuting options being considered by this conference are not questions open to choice in particular resource development decisions. Similarly, public policy can insist upon or prohibit the creation of a new town in resource development. Alternatively, public policy can compel development to be based upon an existing regional centre and can require that the impacts and the associated mitigation measures be treated as direct costs associated with the proposed development.

Free Trade

Lastly, I suggested at the outset that the outcome of the current debate over trade liberalization, particularly between Canada and the United States, may have important consequences for the choice between commuting and settlement options. At first glance this is obvious owing to the critical importance of international trade in the historical and contemporary development of natural resources in Canada. Indeed, much of the support for free trade found in the western provinces arises from the same recognition of this. However, there may be other, less obvious, implications which deserve mention here.

As I have just argued, resource development in Canada now occurs within a complex and changing framework of public policy interventions at both the national and provincial level. Many public policies have, of course, been designed to assist, directly or indirectly, the private sector in the exploitation and development of Canadian natural resources; others, of course, have increased costs to the private sector or otherwise made their development activities more difficult.

The current debate over free trade has revealed, among other things, a concern, particularly from American negotiators, for what have been termed "non-tariff barriers" to trade. It has been argued by American negotiators that a range of public programs, primarily in the social policy area, e.g. unemployment insurance etc. but, as well, more direct economic incentives are in fact forms of "subsidy" which permit Canadian business to sell abroad at artificially low prices. It seems to me that it is entirely possible that, among the spate of public programs which now apply to resource development in Canada, there will be some which free trade negotiators will similarly construe as subsidies which provide Canadian industry with an unfair competitive advantage in international markets. This possibility is one worth thinking about. Those of you more familiar with the details of the public policy environment and the system of regulations, controls, incentives, etc., within which your particular industries operate, would do well to consider the implications of this framework for free trade negotiations and vice versa.

FAMILY LIFE ADAPTATIONS TO OFFSHORE OIL AND GAS EMPLOYMENT IN NEWFOUNDLAND *

MARK SHRIMPTON

This presentation describes research on family life adaptations to offshore oil and gas employment in Newfoundland. It was done by a St. John's consulting company, Community Resource Services (1984) Ltd., and was funded by the Environmental Studies Revolving Funds, Canada Oil and Gas Lands Administration. The principal researchers were Dr. Keith Storey of the Department of Geography at Memorial University, Dr. Jane Lewis of the London School of Economics, David Clark, who is Chairman of the Scottish Marriage Guidance Council and formerly with the Institute for Medical Sociology in Aberdeen, Scotland, and myself.

Background

Before describing the research proper, I think that it is important to say a few words about the context, particularly in two areas: 1) the offshore oil industry in Newfoundland and Labrador and 2) the Newfoundland economy and society. I think that some familiarity with these two areas will facilitate an understanding of the research and its findings.

First, the offshore oil industry in Newfoundland. It was in 1966 that the first well was drilled, and over the last twenty years a total of 110 more have been drilled at an average 1986 cost of about $50 million per well. During that period there have been six significant finds of oil, the largest of which is Hibernia. There are two other fields that, at least at the beginning of 1986, were considered probably commercial: Ben Nevis and Terra Nova. All are located on the Grand Banks about 200 miles off the coast of Newfoundland, roughly east-southeast from the city of St. John's which has the nearest airport and harbour to the fields.

However, while the petroleum industry has been in the area for twenty years, during the first ten years or more it did not touch Newfoundland and Newfoundlanders to a very great degree. The semi-submersible rigs and the drillships would come in from other parts of the world, engage in a one-well program, usually during the summer, and then move away again. Drilling took place south of the island, on the

Grand Banks, along the northeast margin and off the coast of Labrador. The industry would make some use of local services with supply boats working out of St. John's or Botwood. But not many Newfoundlanders were employed offshore. This was changed in the late 1970s by two events. First, in 1977 the provincial government passed the Newfoundland and Labrador Petroleum and Natural Gas Act and its associated regulations. This was at a time when Newfoundland was claiming jurisdiction over the offshore and this was the legislation which the provincial government required oil companies to conform with its own scheme of things. The legislation required that Newfoundlanders be employed offshore, and set up guidelines as to how this should happen and how many Newfoundlanders should be hired. Second, in late 1979 came the Hibernia discovery. Until that time the amount of exploration had been variable and not that large. However, the Hibernia find -- at the time the most productive oil well in Canadian history -- generated a lot more exploration activity, such that since then there have always been at least four rigs operating offshore, with a maximum of nine rigs at any one time. By 1982/83 over 70% of the total of about 2,000 offshore workers were Newfoundlanders.

Most of the recent drilling has been done by semi-submersible rigs, although previously there was considerable use of drillships, especially off the Labrador coast; however the Labrador program in now defunct. The drill rigs are operated by contractors rather than the oil companies themselves. These are situated over the wells, usually anchored, although some rigs use "dynamic positioning" by way of computer-controlled thruster propellors.

At any one time there will usually be between 80 and 90 people working on the rig; two shifts of just over 40 each. There is no unionization of the rigs with the exception of the Sedco 710 where the Seafarers' International Union have just organized one group of catering workers -- union organization of offshore workers is made very difficult by the fact that a semi-submersible rig might well move out of the country at very short notice. Each rig is supplied with personnel by helicopters flying out of St. John's airport, and with materials by supply boats sailing from the harbour. Most Newfoundland rig crews are on a 21/21 schedule: they spend 21 days working offshore and then 21 days at home. The supply boat crews are mostly on a 28/28 day rotation, however the situation is different in that they get into port on a fairly regular basis, allowing more frequent contact with family and others. There are usually three supply boats to every rig which allows one to be in port loading, one to be enroute and one in a standby capacity by the rig. The drilling area is in what is known as "iceberg alley" and these boats are used to tow the smaller icebergs out of the way if they are bearing down upon the rig. The rig itself can move, of course, but this is very disruptive of drilling. At present, the development is in the exploration phase with wells being drilled either to discover new fields or to learn the extent of identified fields.

Regarding about Newfoundland's economy and society, it will not come as news that Newfoundland has an extremely high unemployment rate, whether or not one accepts the official rate, which is something over 20%. If Newfoundland had the labour force participation rates that hold for Canada as a whole, the unemployment rate would be over 30%. In many rural communities the unemployment rate is over 70%. There has always been high unemployment in Newfoundland and, as a result, there is a tradition of engaging in work which involves being away from home for significant periods of time.

In the present context, one might argue that offshore oil activity related commuting is an extension of this traditional form recalling the Labrador fishery, whereby residents of the Island of Newfoundland spend the summer fishing in Labrador, or the seal hunt where in the Spring the seal hunters would go to the Front. Logging similarly involves work at camps in the interior of the Island. The trawler fishery, Coast Guard, and merchant marine, are other examples. There is, of course, also a tradition of Newfoundlanders moving to places like Fort McMurray and Toronto; however they are always anxious to return to the Rock. Newfoundlanders are a very home-centred, family-oriented people, and generally hold fairly traditional family values.

This context particularly affects the availability of options. A person who is unhappy with his or her family life because of the impact of offshore employment can, theoretically, seek alternative employment (for themself or their spouse), or abandon the relationship. In Newfoundland, both of those options are severely constrained by the economic and social realities.

Methodology

I shall now describe our research on family adaptations to offshore employment by rig and supply boat workers. In a review of the literature, we found about 120 papers on employment which involved periodic absence from home. We did not find this past research very useful, mainly because of its orientation. First there was always the assumption that "spousal intermittence" was problem-generating: that the only impacts were in some ways problematic and that there were not advantages to the periods of being together that offset the periods of absence (or vice versa). Second, almost all of the other studies regarded the male work experience as the independent variable and focused on the female response to it by way of being a dependent variable. There was no consideration of the problems for men and or of any problems. Indeed the approach seemed to be: 'there are all of these women and they have these problems and what can we do to make them cope?' What one might call a "modified valium" approach to dealing with the issue. Third, the other studies mostly were not directed toward policy. With our funding coming from the oil industry through the federal government, we were obliged to make policy recommendations.

The first stage of the research was spent trying to establish the addresses of as many couples as possible in which one spouse or the other was working offshore. We eventually managed to find, with some difficulty, 203 couples. To each of these we sent (to the man and the woman separately) a 14/15 page questionnaire. Some went to families in which it was the wife who was working offshore. At that time there were about 25 women working offshore, about ten of whom were married. We managed to track down three such couples but received no questionnaire returns from them. Thus our research in fact studied men working offshore and their families. We got 150 questionnaires back from women; this is a 74% return rate, which is very good for a 15 page mail-out questionnaire with over 40 items. A high level of interest was also shown by the lengthy responses to the open-ended questions on the questionnaire. From the men we had a 50% return rate which was also satisfactory, especially given that the men were offshore half of the time.

In the second stage of the research we conducted in-depth interviews with 31 families. These interviews delved deeper into the issues which have been raised by the questionnaire responses, and tried to establish joint responses by the couple. The

interviews, most of which were taped, lasted an average of about three hours. In the third stage of the research we held interviews with various "key informants" in industry and government.

Next, let me describe our sample. In terms of the male offshore workers, the average age of the respondents was 34 with a range from 22 years old to 52 years old. The onshore spouses had an average age of 31 with a range from 21 to 49 years. The couples had been living together for an average of 9 years; 16% of them did not have children while those who did had an average of 1.75 with an average age of about 8 years. Most of our respondents had grade 10 or 11 education, while one-third had some post-secondary experience. In terms of the work, 50% had been in the petroleum industry for more than 5 years. Only 20% had 2 years experience or less. Some people have suggested that this is a relatively experienced population while others argue it is a relatively inexperienced group. Clearly it depends on who you are comparing them with.

In terms of the work regime, half of our sample was on a 21/21 day routine, with the other half on a 30/30 day rotation. This indicates an over-representation of supply boat workers (with longer rotation time) since only just under 40% of offshore workers are in fact supply boat workers. Obviously we were more successful either in identifying them for our original sample or in getting responses from them. Among all of our offshore workers only one had any sort of onshore employment during the period onshore. This is rather different from the experience in Norway for example, but given the prevailing unemployment situation in Newfoundland, it is not at all surprising. Among the women, one-third were in paid employment and 75% of those were in full-time employment. This is a lower participation rate than is normal for married women in this age category in Newfoundland.

Findings

The issue is, how are these women and men reacting to offshore work patterns? Generally there was a fair amount of positive response. For instance, one of the open-ended questions asked of the women was as follows:

> "Suppose your best friend is married and has a small baby. Her husband has just accepted an offshore job. He has never worked away from home before. It will mean a big increase in income. What practical advice would you give to your friend?"

There was a comparable question for the man, asking how he would advise his friend who was joining the industry. The most common response was, "take the job". There was a strong recognition that this was an opportunity whpresentation of supply boat workers (with longer rotation time) since only just under 40% of offshore workers are in fact supply boat workers. Obviously we were more successful either in identifying them for our original sample or in getting responses from them. Among all of our offshore workers only one had any sort of onshore employment during the period onshore. This is rather different from the experience in Norway for example, but given the prevailing unemployment situation in Newfoundland,o not get enough time with each other? 73% of women and 64% of men felt the amount of time together was about right. Another question asked whether there was any confusion with respect to family decision-making, and 80% of women and 79% of men said, "no".

However there were some significant variations. Table 1 presents the vignettes which we used. There are three for the women and three for the men. The males we describe as Jim, Mike and Fred. Generally, Jim is having problems with offshore work and its impact on the family, while Fred really likes his situation and Mike lies between these extremes. We had similar female vignettes of Ann, Judy and Mary, with Ann having negative reactions, Judy in the middle, and Mary having positive reactions. We tested this approach independently with a group of men who were working offshore and a group of their spouses and got very positive responses. Indeed, out of all the questionnaire returns, which totalled 256 adding male and female returns together, only one did not answer this question. As such these seem to be vignettes with whom people could associate themselves.

TABLE 1

Male and Female Vignettes

MALE:

JIM can't get used to the work pattern. He dislikes being away from his family. He occasionally gets lonely and depressed.

MIKE'S life seems to carry on pretty much the same whether he is at home or away. He has no strong feelings about being away from his family and his time offshore doesn't cause any great changes in his moods.

FRED likes his pattern of work. He accepts being away from his family but recognizes the benefits of the time he can spend at home.

Thinking of all 3 men, which one is most like you? (Check one box only).

JIM ☐ MIKE ☐ FRED ☐

FEMALE:

ANN can't get used to his pattern of work. She feels life is incomplete when he is away from the family. She occasionally gets lonely and depressed.

JUDY'S life seems to carry on pretty much the same whether he is at home or away. She has no strong feelings about him being away from his family and his time offshore doesn't produce any great changes in her moods.

MARY likes his pattern of work. She enjoys both the time he is away and when he is at home. She can follow her own interests and has more confidence in herself.

Thinking of all 3 women, which one is most like you? (Check one box only).

ANN ☐ JUDY ☐ MARY ☐

Source: Community Resource Services Ltd., (1986), "Family Life Adaptations to Offshore Oil and Gas Employment", Report to Environmental Studies Revolving Fund, C.O.G.L.A., Ottawa

Table 2 below shows the ways in which the men and women classified themselves. The men mostly considered themselves Fred's, the positive character, although 18% were the negative "Jim's". For the women, the spread is much more even. There are more Judy's, in the middle category but on either side 39% classified themselves as "Ann's" who were not finding life very satisfactory, and 38% were "Mary's" who generally thought their situation positive.

TABLE 2

Male Female Vignette Self-Classifications

MALES				FEMALES			
		No.	%			No.	%
Jim	(-)	18	(18.2)	Ann	(-)	58	(39.2)
Mike	(0)	5	(5.0)	Judy	(0)	34	(23.0)
Fred	(+)	76	(76.8)	Mary	(+)	56	(37.8)
		99	(100.0)			148	(100.0)

Source: Community Resource Services Ltd., (1986), "Family Adaptations to Offshore Oil and Gas Employment", Report to Environmental Studies Revolving Fund, C.O.G.L.A., Ottawa.

What can we make of this in terms of who classified themselves as Jim's and Fred's, or as Ann's and Mary's? Before answering, I must note that while we used the vignettes in an attempt to see if there were variations in satisfaction, it must be recognized that not everybody who considers himself or herself as a Jim or Ann is entirely negative, nor is every Fred or Mary entirely positive, etc. We were only trying to get general variations in response.

Looking first at the men, there were some characteristics for which there were no significant differences between the Fred's and Jim's: age, education, length of time they and their spouses or partners had been living together, the number or age of children and the place of residence. In terms of the last, the majority of the Newfoundland offshore workers live within a hundred miles of St. John's with many of them in the St. John's metropolitan area itself.

However, one factor which clearly differentiates the Fred's and Jim's is the type of work. The Jim's (the negative character) are over-represented amongst the rig workers. Indeed, over one-third of all the rig workers were Jim's. The Fred's were correspondingly more likely to be supply boat workers. In terms of work experience,

Jim's tended to have less work experience. The most common work rotation for the Jim's was the 21/21, because they were rig workers, while the Fred's was 28/28, the longer cycle. We also asked "if you were given the choice, what work cycle would you prefer?". The Fred's were generally happy with their current (longer) cycles, while the Jim's wanted a reduction to an even shorter 14/14.

Another question was: "How often do you talk about danger with your partner?" It was found that 22% of Jim's often talk about danger, while this is the case with only 3% of the Fred's. When asked, "If you were offered an onshore job with the same rate of pay and a regular three week vacation, would you take it?", one hundred percent of the Jim's but only forty-eight percent of the Fred's, said "yes". Lastly, in terms of questions for which there were significant differences between the Jim's and Fred's, we asked "Do you hope to still be working offshore in three years?" Ninety-six percent of the Jim's, said "no" but among the Fred's, seventy percent did want to be working offshore in three years.

Moving on to consider the women, again there are no differences between the Ann's and Mary's in terms of age, length of partnership, numbers or ages of children, place of residence, or whether or not they were in paid work outside the home. The (negative) Ann's tend to be married to rig workers, which suggests some sort of joint response. The Mary's are more likely to be supply boat workers' wives, and their spouses have been in the industry significantly longer. The Ann's tended to have lower levels of completed education than the Mary's, and talk and think about danger more. They also, relatively speaking, do not think that they see enough of their partner; find decision making is confused; want their partners to take the onshore job if he is offered one; do not want him to be working offshore in three years; and when the current job is compared to past jobs the partner has held, they think the current job is more disruptive to family life. We also used a measure of mood change in our questionnaire and the patterns of vignettes for both the men and women were confirmed by that, with the Jim's and Ann's experiencing considerable mood swings between the time when they are together onshore and when he is offshore and she is onshore.

I would stress, again, that there is variation **within** these vignettes. They were not set up as a simple, complete, and all-encompassing identification, but were designed as a means to a particular end. The Ann's were not wholly negative and the Mary's were not wholly positive. Within each there are negative and positive reactions. The Fred's, the positive men, had numerous complaints; however, it is the Jim's who are the most consistent and, or course, they are consistently negative. A few quotes from them: "Never go offshore. It's not fit for humans." "It's not like going to work. It's like going to war." and "Money doesn't matter much on a stormy February night." (The last is a reference to the loss of the drilling rig Ocean Ranger and its crew of 84 on the night of February 18, 1982.)

Policy Recommendations

Having established that some people feel negative and that most have negative feelings, where do we go from here? This can be answered by discussing some of the types of recommendations we make, indicating the general nature of the recommendation and the problem it is supposed to address. I will concentrate on a few recommendations that I think will be of particular interest and relevance to this conference.

The first group of recommendations relates to the **need for information**. The research shows there is a clear need for orientation sessions and material so that people coming into the industry know about the nature of the work itself and the work regime. One thing which some companies have done is to take the wives and children for tours of the rig when it is in port. This may be a small thing but it allows the rest of the family to get a feel for the work environment -- the place where the man is spending half of the time. Information about the impact on family life is also very important because, within the families we were concerned with, there seemed to be relatively little communication about such matters. The interviews were very interesting on this point. Some interviews were conducted separately but most involved both partners together, and when this was the case it was not uncommon for the woman to make some remark about how she felt about the impacts of the commuting in a very matter-of-fact way, and for the husband to express considerable surprise. The men seldom seemed to consider how their partners felt about such matters.

We have recommended that a panel of women and another of men be established and asked to discuss the work and family issues and their reactions and responses. These discussions would then be edited into a pair of video-taped presentations both of which would be shown to new workers and their partners. This would help them anticipate and deal with the implications of the offshore work. Such information would be very useful in helping people to cope with the realities for the family's life. Again, this is particularly important because when we asked men about family life impacts they often did not know what we were talking about. They work offshore for three weeks and then fly home and into the "haven" of the family, which cared for and nurtured them; and then, three weeks later, they flew off again. But in terms of "family life adaptation", they had difficulty seeing this as an issue.

In terms of specific reactions to the work pattern, I would like to focus on one example which is an area of particular concern: anticipations of, and reactions to, reunion on the part of both males and females. In the interviews, men described the psychological excitement of reunion in vivid terms: the 'surge of energy' for the one or two days just before going ashore, the 'butterflies'. One man said of this hyperactivity, 'the last two or three days I'm out here, everybody knows I'm coming home. I can guarantee you that.' Yet on reaching home, he described himself as often grouchy and tired. The majority of men interviewed described their chief need upon reaching home as sleep. This was particularly true for those workers who worked a full shift immediately before leaving the rig for home and those who lived far from St. John's where the travel time was longer.

In the words of one of these men, 'When I get home, she is raring to go and I just wants to sit home.' Many men said forcefully that they did not want to confront household problems nor necessarily talk to their wives, although most of them were willing to put up with the childrens' clamor even when tired.

> "When I comes home from the rig, I am all winded up. Twelve hours a day of steady winding up, by the time you get out of there, I am like a spring that is totally wound up. When I get home I just want to unwind. Sometimes, I just even want to get drunk and forget about everything and wake up with a big hangover and then slowly break into life at home. But if I comes home and hears a problem, right away I've got to jump into another role. I'm the daddy now. I got to take care of the son or the wife

needs comforting or the sink's broke down or something, so you are playing two different roles I find."

In response to the questionnaire, another man advised his imaginary friend (regarding offshore work) to get used to hearing, 'I wish you'd been here'. One man interviewed put it rather more forcefully complaining about the occasions when his wife started to recount her difficulties during the previous month, 'I don't need that, do you know what I mean? On coming off, I just want to rest for a day or two. I don't need to be hit with something that is her job.'

From the other perspective, the women interviewed also reported feeling extreme tension, anxiety and excitement before reunions. One said that she was initially physically sick every time while another used to break into cold sweats as she drove to the heliport. Such extreme feelings diminish over time but the butterflies remain. The vast majority prepared for the husband's return with an orgy of cleaning and baking. One women, for example, always made strawberry shortcake, cookies and a double-layered chocolate cake. Often women's expectations at the partners homecoming are doomed to disappointment. As one remarked,

> "Yes, that really pisses me off. Here I am preparing myself for the great day when he gets home, psyching myself up for a good time and everything else, and then he comes home and all he can do is sleep for the first week. It's like a slap in the face because the week before he gets home I say, 'Bill gets home in one week, three days, two days, you know, the countdown. Then he gets home and all he does is sleep."

There are similar tensions around the partings but, again, there doesn't seem to be much of an exchange about them between men and women. Partings cause more of a problem for the women because the change occurs in the one context of the home; this remains the same when he appears and has to be adapted to, and then when he goes and his absence has to be adapted to. The man, on the other hand, sees two separate worlds: the work world and the haven of the home.

Another area in which information is needed is basic guidance like whom to turn to in times of difficulty. This concerns the women, in particular. For example, there is little information easily available on how to contact the rig, how to deal with financial problems, and where to find crisis-counselling. Yet it is important to provide such information through orientation or other means. This may be especially necessary for the women because of the lack of what one speaker at the Towns, Wheels or Wings conferance earlier referred to as the "human bonds" which resource towns can create. Within resource towns there is at least the possibility that the women are connected and can talk about their problems. But where there is just a single oil worker's wife in one community and the nearest other one may be in different community miles away (and the husbands probably work on different rigs) there are no such connections. There may be only isolation and a lack of any opportunity to share the problems with others who understand.

Briefly, there are two other major areas where we have recommendations. First, **telecommunications**. At the moment the options are two-fold. One is regular telephone-type communications in which case you probably cannot hear what your partner is saying or, if you can, it is likely that half of the North Atlantic can also hear, which limits the intimacy of the exchange. The second system is satellite

communications, but some companies do not permit workers to use that channel of communication, and while others permit it, the service costs $17.00 per minute. We make recommendations with respect to that problem in terms of subsidizing calls or providing some free access time. This would be no different from the policy of, the Newfoundland provincial government, for instance: if you are away on work for more than three days you are allowed a three minute call home. It is very important to be able to do that—not necessarily to do it but to **be able** to do it—to make that contact.

Lastly, a few words about the **work culture** of the offshore drilling industry—the "cowboy culture" is a term used by both Newfoundland and Norwegian workers. Generally it reflects discomfort with the style of operations offshore (especially on some of the U.S. operated rigs), but the issue with respect to the family is just the contrast and the conflict between the very physical hard offshore environment and culture, and the home. Both women and men directly and indirectly raised this concern. Information can help deal with this but it has been shown that improvements can also be made in the way things operate. The situation has, in fact, improved lately in such areas as the provision of recreational facilities like exercise rooms, television and videos. These facilities are more commonly available, and help to provide continuities between home and work. Better telecommunications links are similarly important in this respect. The fact that your cabin is a place where you can phone home or receive calls, can be very significant. The living quarters have slowly been made more comfortable, and this can be extended, especially when production platforms are introduced.

I am thinking here particularly of the experience in Norway where there has been a conscious attempt on the part of the government to ensure that the offshore society, as far as possible, reproduces the onshore society. This has been done, for instance, by providing improved telecommunications, improving the physical quality of the work environment, and by recruiting a more typical cross-section of the population. In the case of the last point, 6-7% of all the workers on Norwegian offshore platforms are now women. And the response on the part of all has been very positive; it is acknowledged that the effect has been to "humanize" the environment and introduce greater continuity between the home culture and the work culture, which makes that transition easier for both.

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* Since the conference this study in full has been published. See K. Storey, J. Lewis, M. Shrimpton and D. Clark, 1986. Family Life Adaptation to Offshore Oil and Gas Employment. Environmental Studies Revolving Funds Report 040. Ottawa. ISBN 0-920783-39-2.

QUESTION PERIOD

Question: Does each offshore rig worker have his or her own cabin, or is there just a suite of rooms?

Answer: In fact, the workers do "hotbed" it. There are two twelve-hour shifts; one person gets out of the bunk and another person gets in.

Question: Would it not be better if each individual had their own bed?

Answer: I do not think it represents a problem as long as they can personalize the cabin, or at least have part of the cabin which can be personalized. That is important and is one of the things that we did recommend.

Question: I see in your study that you examined the day-to-day situations of people working offshore in regard to their family relationships. Did you, as well, find out what their recollection was about how things worked before they went offshore?

Answer: Yes, indeed we did, in fact, ask them whether they preferred their current employment and its impact on family life with past employment, and took a note of what that past employment was. The reactions were mixed. I think that I alluded to some of them. There is no doubt that the money is good working offshore and the job security (thus far at least) is seen as advantageous. The point can be made that the happier you are the more happily you compare your current job with your past one. I do think that one of our findings is relevant to this aspect in that something like the supply boats are very similar to the troller fishery in terms of the work place and the small team working together offshore. This kept on coming out time and again, how the supply boat workers were offshore with their buddies, in a traditional form of work, and that was great. For the rig workers it was totally different—there was much more unhappiness. I do think we have to regard the oil industry as being a new experience creating new problems rather than saying, "well, it is just another sort of work and maybe these people have not gotten used to it".

Question: Were respondents asked to state their preference for different work cycles?

Answer: We did expressly ask that question. We had 28/28 all the way down to 7/7 and asked: what do you currently have; what would be your ideal; and which would you least want? The 28/28s wanted 28/28; they were happy. The 21/21s wanted to become 14/14s if they could, and those are really the only options which are currently available. It has to be said, of course, that you may think you would like 14/14 but to live and experience 14/14 might be something else again. Theoretically, a week less offshore sounds great and a lot of men talk about their exhaustion during that first week. However, we have seen the problems of partings and reunions, so does one really want to increase the times when you have to go through those by 50%? The answer is, I really don't know. I think that it would be very interesting to compare the satisfaction of the different groups—we have stressed that some research ought to be done on this—one group working 21/21 and another 14/14. And, of course, there are

other possibilities: in the Norwegian offshore, on the platforms, a very common pattern is 14 days offshore and 21 onshore. While this results in somewhat less income, it is a regime that the workers seem to be very happy with. Again, I think that one has to actually do comparative analyses rather than just looking at abstract preference.

Question: Were the contented male workers married to the contented women respondents and, conversely, the discontented spouses married to each other?

Answer: To some degree, although you have to recognize that only 19% of all males were the negative Jims, whereas almost 40% of the women were the negative Anns. There must be some unhappy women married to happy men and that does not surprise me, frankly, in terms of the interview contents.

Question: I heard Keith Storey present some of these results on an earlier occasion and I just need clarification. Were there no differences whatever between the women that had jobs and the women that stayed at home, in other words, who were full time homemakers?

Answer: In terms of the Anns and Marys, no. It was one of the variables which was not significant. There are a number of hypotheses we might have made especially based on Scottish research. For instance, results suggested that women who had been married a relatively short time—they were termed "novices"—who had young kids at home and had no previous experience with any spousal intermittence, would be particularly vulnerable. They would be more likely than the others to be Anns. We did not find that. There were no significant differences on any of those variables, which was an interesting research finding.

Question: Why do the Jims, who are very dissatisfied, continue to work on the rigs offshore?

Answer: If Newfoundland were to have a 10% unemployment rate, the Jims might well not be there. The Jims would be working at something else, thanks all the same. They are desperate enough to get out of the industry, but at present if you are a Jim and have a wife and two or three kids at hime and there is 75% unemployment in your home community, if you have a job offshore, you may hate every minute of it, you may think (sorry, this has been deleted)

Question: What can be expected to happen over the years, as petroleum development matures offshore Newfoundland?

Answer: Presuming we have the same kind of population, generally it will be the Jims and Anns who leave the industry, and of those who enter, there will be a predominance of Marys and Freds. I suppose this depends on whether industry hires new Freds and Marys or Jims and Anns. The Hibernia production life is supposed to be twenty years. I would like to think that if we went and did a survey of the workers on a production platform in the year 2015 by then the Anns and Jims would not be that much in evidence. In the meantime, however, they have a lot of problems.

PANEL DISCUSSION: "INDUSTRY ASSESSES THE COMMUTING OPTIONS"

A. Towns versus Commuting at the Rabbit Lake Uranium Mine

Fred Nogas, Human Resources Specialist, Engram Industries Limited

My role today is to provide an overview of the perceived problems that Gulf Minerals faced in starting up the Rabbit Lake uranium mine (now owned by Eldorado) and our assessment of the options as we saw them at the time. The challenge that I saw then particularly interested me from a human resources standpoint, including the motivational implications. Although the situation in the far north was not new to an oil company such as Gulf, this was the first instance that a mineral resource was involved and the different type of infrastructure required, and the different sort of manpower required with inherent staffing problems.

Let me give you a little background of the project. It resulted from a discovery of uranium in northern Saskatchewan in 1969. Estimates then were that the ore body would probably sustain a mine from 10 to 12 years, a mill that would process about 2,000 tons of ore per day, producing about 5,000 pounds of yellow cake per year, which then would be shipped to Ontario for processing.

Concerning the staffing problems in the 1970s, we had tremendous competition from the oil sands mega-projects and many other mining projects throughout Canada. Of course, the Rabbit Lake area, which is approximately 450 air miles north of Saskatoon, in common with other northern mining enterprises, faced the difficult problem of recruiting an adequate work-force. There were several studies by the Mining Association of Canada that told us there was a scarcity of mine workers and they were going to be even scarcer, not only because more jobs were becoming available, but fewer people were willing to go into mining. Statistics from the federal department of manpower and immigration showed that there was a continual drop in the proportion of skilled and unskilled labour that was willing to go North. High turnover, as the statistics showed, was really aggravating; we were just horrified to find that we would probably have to face anywhere from 35% to 400% turnover. Coming from the oil patch that was not an encouraging figure because there if you have more than 1/2% to 1% turnover, the company's human resources department

could be replaced. So there we were with a rich ore body and the very gloomy prospect of not getting adequate manpower. We recognized that staff turnover was obviously going to be influenced by the (i) remoteness of the mine and the townsite, (ii) the traditional high mobility of miners, and of course, (iii) the high cost of living in these isolated communities. (It appears the situation has not improved today—I read in the Globe and Mail recently that in Tumbler Ridge asparagus is priced at $6.99 per pound, cheese at $3.85 per pound, and homes average $80,000.)

We also looked at the indigenous population in the area. I recall that it was dispersed to something like .4 persons per square mile. There was a small Indian settlement called Wolliston Post about 30 air miles across the lake, with about 200 men, women and children living there, of whom perhaps 40 or 50 might have been employed, but none of them had any industrial experience whatever. This certainly did not form a labour pool that you would count on to start up a complex mine/mill operation. There were larger settlements to the north and to the south, namely Stoney Rapids, Fon Du Lac, Uranium City, Black Lake and La Ronge. Our real concern was to develop programs that would provide opportunities for northern native employees without disrupting their traditional lifestyles. With that in mind we launched a program of consultations with the various band councils, their leaders, such as David Ahenakew and George Mercredes and Ivan Ahenakew, who then worked with the federal government. One of the results that came out very clearly (based on the native workers' previous experience with contractors and explorations companies, and the like) was that they did not see that they could be integrated very well into our, non-native lifestyle in a typical northern town. As far as the native leaders were concerned, it would be very difficult to entice their members away from the reservations to bring them into a townsite.

Given the prospect of no miners being available in the south and the northerners not wanting to live in a townsite, what was our next step? We set some practical objectives: first, we had to minimize the factors creating negative attitudes towards employment in remote areas; and second, we had to establish an effective, and I emphasize, <u>effective</u>, positive employee-relations program.

We did not want to reinvent the wheel so we did the obvious and visited various operations that were known to be premium mining operations. I will not mention which they were but we did have a long list and we did spend many, many weeks going across Canada and the U.S. picking out the policies and practices that worked well, particularly those that would be parallel to what we were trying to establish.

A third objective was to provide job opportunities for northern native employees—by "northern" meaning within a radius of some 250 to 300 miles from the campsite. The fourth objective, in view of the relatively short lifespan (estimated 10 to 12 years), was to develop a very flexible program. Our policies and procedures had to be flexible and change with the times and with events. Of course we also wanted to minimize the disruptions to employees that would result from eventual shutdown of the mine. Our fifth objective was to make a profit. With those objectives established, we set about looking at the alternatives.

The obvious option was a company town. Thus our first consideration was to engage a town planning firm to develop a townsite plan for us—a basic urban design with the characteristics of any new mining community in an isolated area. We brought in the architectural consultants and the behavioural scientists and the sociologists, and

so on. We had a beautiful townsite planned. It was to be a townsite for a population of approximately 1,000 with a minimum infrastructure, 200 miles from the closest community of any size to the south. At that time, the Government of Saskatchewan was pushing a road northwards to the site but we certainly could not count on it being a road that we could use for commuting. We also sought the advice and counsel of various individuals from the different levels of government and industry—particularly the federal government because as a uranium property the project came under the Atomic Energy Act, and, therefore, under federal jurisdiction.

What were some of the findings? From the academic world there was a wealth of information and research on northern communities, and in particular during that period, studies by the Centre for Settlement Studies at the University of Manitoba. There were very interesting observations and comments about 200 similar settlements throughout the North. We found that under normal conditions a town's livelihood may be expanded or revitalized as other sources of employment are developed; however, the economic and other conditions in most parts of Canada, when translated to the North, are not normal. The prospect to diversify the economic base of that particular townsite was quite limited, indeed we thought at that point, perhaps impossible. We condered the danger of economic decline and the specter of a ghost town—we all well know the cost of that type of situation, to the developer, to all levels of government, and of course, to the employees, not to mention the cost of dislocation of families and unemployment.

What did we conclude about the single enterprise community based on the extraction of a remote resource? That it is not the result of a natural socio-economic force in community formation and growth but, rather, really violates the traditional urban development of a gradual growth from hamlet to town to city and a urban area, normally along well-travelled transportation routes. Therefore, it is not surprising to see the boom and bust effect when the economic conditions change.

When we looked at the human side, the results from the studies were obvious. Some of the stress symptoms related to isolated northern communities were discussed yesterday at the conference, such as the mental health problems—especially depression—alcoholism, drug abuse, extreme loneliness. Diana Ellis spoke about wife battering and child abuse, feelings of insecurity and uncertainty. Again, referring to the newspaper story on Tumbler Ridge, there is insecurity, uncertainty, cabin fever, or as Ms. Ellis calls, "Mackenzie blues". The stability of the labour force we found, could be dependent on the quality of the education system. In the end, one of the key factors in attracting, particularly, some of the original supervisory and technical staff, was the opportunity to have their families grow up in perhaps a larger community; one of the comments we heard was, "Well look, I paid my dues in the North, now it's time for me and my family to enjoy a more urban life".

What, then, was the alternative? Coming from the oil patch, we certainly wanted to look at the fly-in. At that time, Gulf was operating in the far north, and Chuck Hobart and others were giving us reports on the use of native employees. Rotation on the basis of one week out and one week in was perhaps viable—Hudson Bay Oil was operating on that basis at the Brazeau Hills gas plant and eventually in the Zama area; it seemed to work for them, albeit with a very small staff. No one had ever tried it in a mining operation with approximately 300 employees. We began to look at how we could put a program together, knowing that to be successful, we had to recruit and maintain a very competent, high quality, and stable workforce, in order to

produce and compete in the world market, not only then but in the future. One speaker mentioned yesterday, and certainly it was our notion, that the human resources were going to be our most precious resource, to recruit them and retain them. From then on, all of our efforts were directed toward designing a flexible employee-relations program that would attract that type of person. We had an attitudinal survey done in the areas between Saskatoon and the mine site by a professional opinion poller who interviewed families, wives, husbands and other perspective employees. The conclusion was that a fly-in system was feasible, that the workers would rather commute than move to a small, isolated townsite. At that point we had enough evidence to initiate the fly-in regime.

Certainly the corporation had to adjust, and organizationally, Gulf Minerals had to set up environmental and socio-economic departments, a human resources planning group, community and corporate affairs. We had to get more involved in community affairs than ever in the past. We hired and trained personnel who were sensitive to community issues. One of the areas stressed was that there be more of what we called "executive visibility on-site". By that was meant really the policies and procedures were not being set in some far-off distant land; that communities, too, were truly involved and interested in the success of the project.

Corporate communications up and down the hierarchy were very important. To illustrate, employee benefits and salary was one of the areas where there was departure. Gulf Minerals decided to put everyone on a salary concept—and in that way, treated equally. There was no blue collar vs. white collar syndrome or a blue collar plan and a white collar plan. Every employee had the same, identical plan. Because the project was estimated to be a relatively short one, we had to change the entry periods for various benefit plans; in other words, there were no waiting periods to become eligible for the benefits, vesting in the pension plan had to be accelerated, and so on. This was all very new to a big corporation and, believe me, it took awhile to show that the project was different. We had to convince the then federal Minister of Labour, the Honourable John Munro, and his staff that the Rabbit Lake project was different. Our employes could not work on an eight hour shift and we were able to convince the Minister that they be allowed to work an eleven-hour shift on the basis of two shifts per day seven days in and seven days out, amounting to twenty-three weeks at work and twenty-three weeks at home, with six weeks of combined annual vacation and statutory holidays. A Commission of Enquiry was established under Stu Gunn, the Commissioner, in fact, there is a summary of it in the Institute's annotated bibliography. The commission concluded that although there were some reservations expressed by some groups, mainly the various labour groups, the favourable response of employees at the mine led the Commissioner to recommend that Gulf Mineral's application be accepted. The Commission also recommended that the Department of Labour monitor turnover, illness, injury, sickness, overtime, and radiation exposure.

We did not plan on any recreational facilties in the early stages. We agreed to hire the employees first and then let them decide. Sure enough, I recall that the first thing someone suggested was a swimming pool. Well, that was the furthest thing from what they all really wanted, but in essence the employees (collectively) really decided, once we hired them, what facilities they wanted.

Now you may ask, "how is it working"? I think that it is working well. Turnover started at about 28% back in 1975. It is down to about 5%. Safety, for those of you who talk in terms of frequencies and severity, it is 34 and 300 respectively over 10 years. There has not been a single fatality—which was one of the concerns related to working those long hours with fatique and radiation hazards. More than anything, however, the retention rate: as of last week, there were approximately 100 employees that have been there from day one.

B. Polaris and Red Dog
Hank Giegerich, President and General Manager, Cominco Alaska Inc.

First let me give a brief history of Cominco and some background on our development of isolated mines in the Arctic over the past fifty years. Cominco is an international mining company, headquartered in Canada, and operates mines and plants in many western world countries including Canada, Greenland, Spain, Australia and the United States. Cominco is the largest producer of lead and zinc in the western world and, at present we supply over 10% of the western world's requirements. Cominco also produces copper, tin, tungsten, gold, silver, diamonds, potash, ammonia, urea, and phosphate fertilizers. The company which I head, Cominco Alaska, is a subsidiary of Cominco and is responsible for the development of the Red Dog zinc/lead mine in northwestern Alaska.

Cominco's operating experience in the Arctic began almost 50 years ago with the construction of Con Gold Mine in Yellowknife in 1937 and 1938. At that time Yellowknife was very isolated. It took two days to fly the 600 miles from Edmonton, Alberta to Yellowknife. Due to the lack of a dependable transportation system, the only viable approach, if any sort of long term mining operation was to be considered, was to build a townsite at the mine, including school and hospital facilities. At Yellowknife, Con was followed by the Negus Mine in the early 1940s and the Giant Mine in the late 1940s. By then the City of Yellowknife had been built to the stage where the educational/medical requirements for the area could be supplied by the city.

Today, Yellowknife is in a somewhat unique position for a resource town. The community is now not very dependent on the mining industry for its existence as it has become a governmental and communication centre for the Northwest Territories. If the mining companies were to shut down today, it would probably not have much effect on the viability of the city.

Cominco's next northern development, in the 1960s, was a lead/zinc mine at Pine Point on the southern shores of Great Slave Lake about 100 miles south of Yellowknife. Like Yellowknife, the town of Pine Point was established as an isolated sub-arctic community to support the mining operation. Today, Pine Point has housing and community facilities for approximately 2,300 people. Unlike Yellowknife, however, once the Pine Point Mine operation ceases there will be no real reason for the community to continue. It is possible that Pine Point may be closing down within the next few years if additional ore reserves are not discovered. With Pine Point, we could see a situation analagous to the towns of Faro and Clinton Creek in the Yukon. Faro became a ghost town in the early 1980s when the Cyprus Anvil mine shut down, but may have a short rejuvenation as it appears that the mine will start up again for a limited period of time due primarily to the generosity of the federal and Yukon governments. One can only hope that the positive effects on the economy of the Yukon will outway the damage to the Canadian and world base metals industry.

This short-term rejuvenation will not alter the end result. For all of these communities, when the mine operations end, the town also ends. It is unfortunate but true, and inherent in the creation of resource towns that they ultimately lose the reason for their existence. Because of this, and, even more importantly, with the availability today of fast, dependable, low cost transportation plus the innovations which have come about in the communications field, Cominco has moved from building resource towns to creating fly-in/fly-out, or to use the term in this conference, 'wings'

option. A contributing factor is the cost saving that this can provide to government and to the mine developer by eliminating the necessity to create the social infrastructure that accompanies a townsite. In this way, existing facilities in existing communities can continue to be utilized and duplication is avoided.

Cominco's next experience after Pine Point was the Black Angel Mine in Greenland. In conjunction with the authorities in Greenland and Denmark it was decided not to build a townsite at the mine. From Cominco's standpoint, this simplified the project and reduced the capital cost. From the government's standpoint, it eliminated the expense of duplicating already existing facilities. It also fit in with the existing system in Greenland as the rotation of Danish workers between Greenland and Denmark was well established. Also there were existing communities in the Maarmorilik area where the mine was located from which we could draw people to work at the mine. There was one major drawback and that was a 300 mile helicopter connection between the mine and the international airport at Sondrestromfjord. All of our outside personnel had to be moved by this means and at times, in bad weather, it was a bit of a problem and also very expensive. However, a townsite with families would have required the same transportation system and probably with a greater level of concern in regard to dependability. Therefore, the Black Angel Mine became our first fly-in/fly-out operation based primarily on single status, bunkhouse-type accommodation and a rotation schedule four months in and one month out. In general, the Black Angel system has worked well. Local hiring was initially very low but as the people in the region became familiar with us, this increased to the point where today over half of the people working at the mine are native Greenlanders. The rotation schedule has also changed to a three month in, one month out system and some of the native people who live close to the mine get home even more often.

The Black Angel Mine, after thirteen years of operation, is now coming to the end of its economic life and will probably shut down some time in the next few years. This, of course, will cause significant economic disruption in Greenland as the Black Angel is the major (and actually almost only) industrial employer and taxpayer. But the disruption is in no way as severe as it could have been if we had built a townsite and moved in families on a permanent basis.

Cominco's most recent Arctic development is the Polaris Mine on Little Cornwallis Island high in the Canadian Arctic. Our experiences from the early days in Yellowknife and Pine Point, and more recently at Black Angel, made the personnel decision for Polaris fairly straightforward. With an established community and an airport at Resolute Bay only 65 miles away, plus a relatively unattractive topography and the availability of good, dependable transportation, the choice was obvious: do not build a townsite, rotate the people.

This also fit in with what we discovered during three years of visits to the Canadian Arctic Inuit community. The people preferred to stay in their villages, at least until they found out if they liked working in the mine. Even then they were not sure that they wanted to move to a new townsite. The rotational concept of Polaris has been well accepted and Polaris has proven to be a popular employer. In the first six months of operation in 1982 the turnover of personnel was only 12% and has since declined. A key aspect of our personnel policy is to hire and train as many northern Canadians as possible. As well, the program of communication with Arctic communities, where we talk to the people about the mine and job opportunities, has continued and will do so for as long as Polaris operates. The present rotation schedule

at Polaris for the non-Inuit is ten weeks on-site with two weeks off. The Inuit work six weeks on-site and have four weeks off. This rotation is designed to meet the needs of the Arctic people to continue their traditional lifestyle such as hunting and fishing, and to maintain close ties with their families and villages.

We realize that it is necessary to work closely with the native people if our Arctic mining ventures are too succeed. This philosophy has worked well. There are good practical reasons: the native people live there, want to live there and have no intention of living anywhere else. As well, they are accustomed to the climate, the country and the darkness. We have found, at least in outside work in the winter, in the cold and dark, that the native people are more effective. Generally, people from the south spend too much time just looking after each other in these conditions. However, in hiring native people there are several significant differences that must be recognized: they have a different attitude toward time and the use of time. As well, because of their traditions and closeness to the land, there are seasonal variations in their desires and ambitions. For example, when spring comes so does seal and whale hunting, and then in the summer it is fishing; with many of the native people, they are going to pursue these activities no matter what. The work schedule must be able to handle this but I have to admit that so far we have not solved the problem. At least we have a better understanding of what may happen and can try to accommodate the workers' wishes to a certain extent. We do this by changes in the rotation schedule or short term replacements such as student hiring in the summertime. We also consider that having a rotation system rather than an established community gives us the flexibility to make these changes.

Accommodations at Polaris have been described as "luxury" and the building as a "high technology igloo". I would have to agree that they are both. The facilities were designed to a high standard in order to attract and keep personnel despite the adverse climate and isolation. The building is three storeys high and includes 208 single rooms with 16 double room suites for senior staff and married couples. As well, about half of the single rooms are designed with connecting bathrooms so these can be easily converted to married accommodations. The sleeping rooms (referred to as home by those who work at Polaris) are grouped around common lounges and kitchenette areas. The dining room which accommodates 150 people at a sitting is connected to the main lounge. There is always plenty of food available and it is of an excellent quality. When in season, the kitchen also stocks up on the local foods such as char, seal and cariboo meat. The recreational facilities at Polaris rival those offered by most athletic facilities in "established communities". We have an indoor swimming pool, two saunas and a whirlpool, plus a weight room, gymnasium and a jogging track. If the people are not interested in any of these opportunities, then there is a library, a reading room, a video/T.V. room and a pool room.

We are now applying much of what we learned, the thought and experience, at Polaris to our new Red Dog Mine. Located in northwestern Alaska, it is being developed by Cominco Alaska and the NANA Regional Corporation, one of the thirteen native corporations established under the 1971 Alaska Native Claim Settlement Act. Our reason for using the same philosophy and techniques at Red Dog as we employed at Polaris are as follows: first, the climate is similar to Polaris, although the temperatures at Red Dog are a bit warmer and the summer period is longer; but the winter problems are basically the same—cold, darkness and isolation. Second, location. Red Dog is 125 miles north of the Arctic Circle in an isolated and remote part of Alaska. Currently the only method of access to the mine is by a scheduled

flight from Anchorage to Kotzebue and then chartered flights to the mine. When the mine is operating, we will be looking at the possibility of scheduled flights directly to the mine but the major method of access for people will probably always be by air. Third, local desires. It is the wish of the people in the region and our partners, NANA, that a community not be established. Their concern is that a new community could adversely affect the present family and village structure and the subsistence way of life, on which the region's residents are still dependent. Fourth, established communities. The neighbouring communities already have the necessary social infrastructure which would be duplicated if a new town was created at Red Dog. Furthermore, Kotzebue, which is the largest city in the region with 2,500 people is about a 45 minute flight from Red Dog and has a hospital, education facility and most other social ammenities. Fifth, available workforce. People who are qualified and available to work at the mine already live within close proximity of the mine. There are eleven villages in the NANA region with 5,100 people, and the furthest village is only 150 miles away from the mine. This compares with Polaris where we are flying in native people from as far away as 1,500 miles. Sixth, cost. The fly-in/fly-out arrangement eliminates the cost to Cominco as developer and to government for building a new townsite with all of the necessary community facilities.

At Red Dog, in contrast to Polaris, we are looking at a much faster rotation schedule—two weeks at the mine, followed by two weeks home. There are a couple of major reasons for this. First, such a schedule will allow the people more frequent access to home and their fishing/hunting pursuits. We hope that this will relieve some of the pressure we have seen at Polaris for the people to get home to look after the family and fill the larder. Second, with the close proximity of the villages, all with good airstrips, this more rapid rotation is both technically and economically feasible. With one Twin Otter flying three days a week, we can rotate the whole crew in this two week period. This faster rotation will not by itself solve the spring/summer hunting/fishing dilemma, but we think it will help.

In the future, I think you will see more 'wings' resource developments in the North. The practise is already well established in the oil and gas industry in Alaska since the development of Prudhoe Bay on Alaska's North Slope in the late '60s and early '70s. Also, in Alaska's timber industry, fly-in/fly-out communities are becoming increasingly popular. Again, it has to do with economics and the desires of the people.

In summing up, if I were to list the criteria by which private industry and government should evaluate whether to establish a community or move the workers in and out, I would including the following: location, climate, transportation and communication systems, desires of the local people, the extent of established facilities, and cost. The decision may not always be as clear as it has been at Polaris and Red Dog. The effect on family life, the need for educational and medical facilities, the desire to avoid unnecessary duplication of community infrastructure, the necessity for a long term dependable workforce—all of these must be balanced and each situation will be unique.

I have spent most of my life in mining towns. In northern Quebec in the '30s, the Northwest Territories in the '40s, southern B.C. in the '50s, small communities in Montana and again in B.C. in the '60s, and then back to Yellowknife in the '70s. As I noted at the start of this talk, in the early years of northern development there was no alternative to resource towns. From my experience, for young people it was a pretty good way to grow up. But there is no doubt that we lacked the facilities that today

are considered essential for family life. Today the fly-in/fly-out alternative can be seriously considered from the standpoint of the effect on the people, families and communities, as well as the technical and economic feasibility. The 'wings' option does not solve all of the problems and in some cases can create new ones. However, it does significantly reduce the cost of new natural resource development, and to a certain extent, at least in mining, to make the life of the developer somewhat simpler.

I recall my father, a mining engineer who spent most of his career at mines in northern Canada, telling me after he retired that his three chief operating problems in the isolated communities in the North were "wives, children and dogs, and in that order". So the fly-in/fly-out system to a certain extent does make life simpler for the engineer. But we must make sure that it does not make life more complicated for the people working at the mine because they are the most important people. They are the ones who, in the long run, will decide the success or the failure of the venture.

C. From Towns to Wings to Wheels at Sterco

Larry Berg, Vice-President, Human Resources, Luscar Ltd.

The title of this conference is certainly appropriate to the experience that I am familiar with at Luscar Sterco. We sought unsuccessfully to create a townsite there; we resorted to 'wings', specifically helicopter rotors, and then, more recently, we adopted 'wheels'. While this is not as happy a story as some others, it is a very viable outcome. You will see that the compromises involved were very difficult ones and required the balancing act outlined yesterday by Nick Poushinsky. Let me take you through our decision-making process, starting with an introduction to the mine itself.

Luscar Sterco is the operating company that was formed by Luscar Ltd. in 1977, to develop what we call the Coal Valley Mine. The mine is located in a very sensitive area environmentally, in the eastern slopes of the Rockies. It is a surface operation capable of producing over 3,000,000 tons of clean coal annually. The principal customer is Ontario Hydro and secondarily, the Japanese thermal industry. The coal is transported a unit train operation, shipping to either Thunder Bay or Vancouver. At capacity, the mine would employ about 600 to 650 people although currently it is running at 60% capacity and employs 335 people—downsizing is a pretty familiar theme in the coal business today.

When we began planning for the operation in 1975, there were four settlement options available to us: the option of new townsite; of rail transportation for our employees; similarly, bus or ground transportation; and the option of air transportation from the community of Edson or, of course, the city of Edmonton.

The factors that affected the outcome have been highlighted by several speakers at this conference. The decisions were influenced by the precise location of the mine, public policy in Alberta and certainly the public purse, the question of mine economics, and the quality of working life which would be created for employees. While these considerations are not mutually exclusive, they certainly require trade-offs.

Geographically, the mine is located in an area of Alberta referred to as the "coal branch", 180 miles west of Edmonton and 57 road miles from the nearest communities of Edson and Hinton. This area has an interesting history and is no stranger to resource development. The "coal branch" in the 1930s and 1940s was home to over 18,000 people who lived in a series of coal towns, some of which were operated then by predecessor companies of Luscar Ltd.—very viable, very lively communities. All of these communities with the exception of two, were abandoned in the 1950s when the railway switched from coal to diesel. This, in turn, affected public policy relating to resource town development in the area.

Our preference was to develop a townsite, initially based upon the Luscar Sterco operation but capable of serving as a core community which would accommodate the considerable development envisioned for the area. This was Alberta, remember, in the late 1970s—everyone was planning to open a coal mine. Denison was going to open a mine called Dentherm north of our mine at Coal Valley (Luscar Sterco) and Manalta was planning to develop a property at McLeod River. With regard to metallurgical mines to supply the Japanese steel industry, we were undertaking an expansion of our Cardinal River mine and, next door, Manalta was developing the Gregg River mine.

This development promised 2,500 jobs directly, hence we regarded our proposed townsite as very viable. Fortunately, and I say this with great hindsight, the Alberta Government's coal policy, which was released in 1976, disallowed new town development in the coal branch. In retrospect, it was the right policy. Both the McLeod River and the Dentherm projects have been shelved. Our own Luscar Sterco and Cardinal River Mines are operating at 60% capacity. The boom that people saw in Alberta in the late 70s just did not materialize.

As a result of the government's policy, we had to consider transportation options. Among these, ground transportation was deemed to be unacceptable for two reasons: the distance was 57 miles (and it felt like 100), over unimproved gravel road which would require a minimum of three hours daily travel by each employee. This was not consistent with the quality of life that you would want to provide for your employees.

At that time in Alberta, there was an extreme scarcity of skilled trades people. Jobs were plentiful at Fort McMurray with the Syncrude project and employers had a very difficult time attracting skilled workers. We did not believe that we could attract or retain the workforce which we needed to make the mine successful. We looked at a 'rapid rail' concept that offered some attractive features. Unfortunately, it was extremely expensive and would have interfered with coal unit trains movements and was thus discarded. The only remaining alternative was to fly the workers in and out.

We looked at two options in terms of air travel: fixed wing and helicopter. Fixed wing, unlike the situation at Rabbit Lake or at Polaris, required better weather conditions than was available to fly reliably in the eastern slopes of the Rockies. Additionally, we would have had to build an airstrip some distance from the mine and bus people to the site. A helicopter, on the other hand, could land at the mine doorstep and handle the variable weather very well. We leased two S61 machines with a capacity of 32 passengers each. Among the advantages of helicopters was our ability to transport over 350 people a day, a twenty-minute trip one way from Edson to the minesite, and very high availability, both weather and mechanical. The use of helicopters both necessitated and facilitated twelve-hour shifts which we regarded as an advantage. I think that in resource communities, it is by far the most attractive shift schedule, and I would like to thank our friends at Rabbit Lake who were the first to introduce twelve-hour shifts to mining. By using them as a model, we were able to obtain approval, as the first mine operator to do so in Alberta.

This shift schedule made helicopters viable; an eight-hour schedule would have required too many flights a day to be viable. However, helicopters did had some minimal flexibility problems. You could not work your people overtime, your crews were split because of the capacity of the machine, you could not "hot-change"—which is when employees relieve each other on the job thus avoiding downtime. It also had what I refer to as the 33rd passenger problem—you could only increase its capacity in increments of 100%, so that if the helicopter could carry only 32 people and you wanted to move the 33rd person, or 43rd for that matter, you needed another machine. This was a difficulty if you were expanding the mine and it was equally true if you were downsizing. But as I have said, those are not real problems. The real problem for us was the cost. Operating two helicopters cost over $7 million a year, which might have been tolerable at 3,000,000 tons a year production but was unbearable at 1,500,000 tons of production.

Therefore, in 1983, when the mine's production declined, Luscar Sterco reverted to highway coach-style buses. I would like to compliment our employees and the union representatives, who understood the economics of the situation very well; while they did not like it any better than we did, they cooperated in a very mature fashion.

Ground transportation was only feasible because the provincial government had in the interim done a great deal to improve the road system.

What can one say about the advantages of busing? Principally, it is less costly and, from an operating perspective, it facilitiates hot-changing of crews. The disadvantage is that it involves two and one-half hours daily travelling time which is tolerable but, I suspect, at the outer limits. Our perception is that if it were 80 or 90 miles, we could not consider at busing as an option. I expect that when the economy picks up, we will experience increased labour turnover. I should reiterate that the people are working a twelve-hour shift (four days on and four days off). It is the consecutive days of rest which makes the 14 to 15-hour days (home to home) tolerable.

As I said at the outset, this was not a particularly happy resolution but certainly a very viable one. It typifies a balanced approach where various stakeholder interests are at least accommodated if not wholly satisified.

While the camp concept outlined by other speakers is attractive, I am not sure the economics of the coal industry today would support the cost. Not all mines are created equal and we measure our product in tons rather than ounces or pounds. If I understood Mr. Roy Lloyd correctly, the cost of the camp at Key Lake by my calculations would be around $40,000 per year per employee; for us Luscar Sterco that would be grossly prohibitive. However, for those operations where daily commuting is impractical, I am sure the temporary camp concept is preferable to a new townsite.

D. Air Commuting in the Search for Oil and Gas in Canada's North

John Batteke, Manager, Socio-Economic Affairs, Esso Resources Canada Ltd.

I am grateful for the opportunity to participate in this conference and to comment on why Esso Resources sees commuting as the best answer to the question: how do we handle the logistics of a work force searching for oil and gas in Canada's North?

Thus far in the panel you have heard from representatives of the coal and mining industries. Esso Resources is not unfamiliar with the production of coal and other minerals -- one of our departments is an active member of the industry. Today, however, I will focus on the experience of oil and gas companies in the North. Naturally, I can speak only of Esso's experience, but I believe my observations will be typical of other operators in the region.

Let me begin by giving you a brief overview of Esso's current activities, then go into a more detailed look at our Northern operations.

FIGURE 1 -
ESSO'S OPERATIONS

As shown in Figure 1, Canada's east coast, we are conducting an exploration program in 1,000 metres of water at Flemish Pass, some 400 kilometres northeast of St. John's, Newfoundland.

Moving west, we have two major development projects in Alberta: our heavy oil project at Cold Lake, and our miscible flood tertiary-recovery project at Judy Creek. In the latter project, we are injecting a solvent that mixes with the oil underground and makes it more free-flowing; this allows us to produce more of the oil present in the underground structure.

I will not discuss Esso's extensive production operations in Western Canada today -- the number of people involved in these ongoing activities is relatively small, and commuting is less of an issue because our personnel needs rarely fluctuate. Instead, I will focus on the personnel and transportation needs of our frontier exploration and development programs.

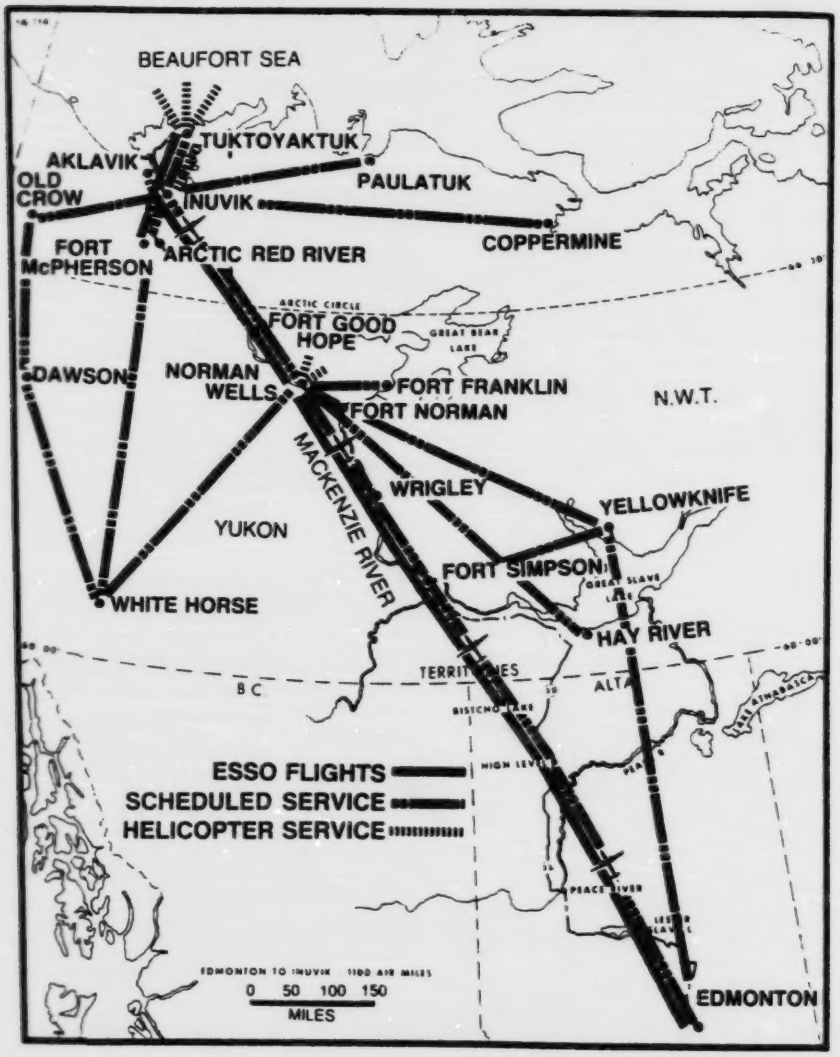

FIGURE 2 -- TRANSPORTATION NETWORK

In the North, we have two major undertakings. The Norman Wells Expansion Project, completed in May of 1985, was a $530 million expansion of an oil field Esso has been working since 1920. Further north, we are exploring for oil and gas in the Mackenzie Delta and the Beaufort Sea. Since the signing of exploration agreements in 1982, Esso and several associates have spent more than $800 million exploring the Beaufort Sea and the Mackenzie Delta.

Effective transportation -- especially air transportation -- is important in the logistical support of these two ventures.

The Norman Wells public airport services Esso's Boeing 737 aircraft as well as Pacific Western's commercial fleet. Flights originating in Calgary, Edmonton and other points in Western Canada carry personnel and specialized equipment into the North.

Esso's 737 and Pacific Western's aircraft also fly in and out of Inuvik. Esso has employment and transportation offices in Inuvik, but our exploration crews are based in Tuktoyaktuk, 100 kilometres to the north. To get to our 120 person base camp in Tuktoyaktuk, we rely on the workhorse of the North -- the Twin Otter.

From Tuk Base, our work crews travel by helicopter anywhere from 50 to 800 kilometres out into the Beaufort Sea to our offshore drilling islands.

So, with operations at Norman Wells, Inuvik, Tuktoyaktuk and throughout the Beaufort, you can see that air transportation is important in our operations.

Figure 2 shows Esso's flights, the scheduled services provided by private arlines and the helicopter services from Norman Wells, Inuvik and Tuktoyaktuk. Before I discuss why Esso is drawing personnel from such a wide area, let me review some of the logistical problems we face in exploring for oil and gas in such far-flung locations.

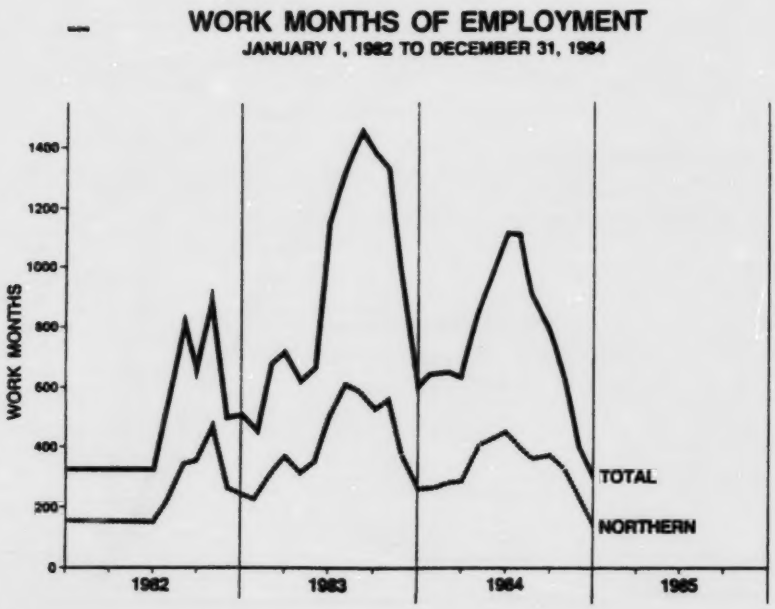

FIGURE 3A -- NORMAN WELLS WORKMONTHS

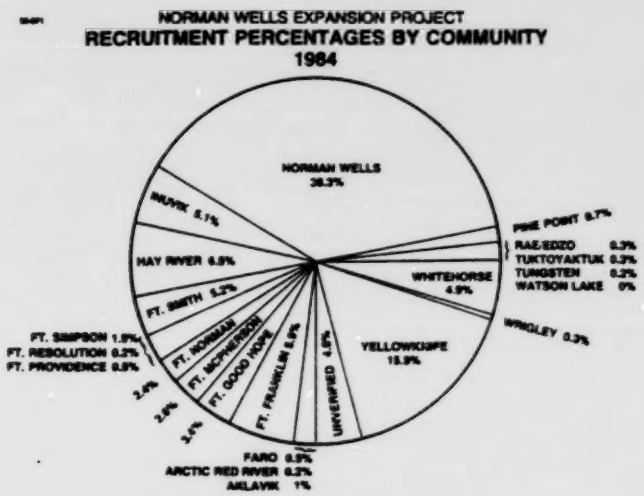

FIGURE 3B -- NORMAN WELLS RECRUITMENT

Two factors affect the patterns of employment and hence our decision on commuting. First, the employment generated by our programs rises and falls with the seasons. Second, we are drawing from a very thinly-spread northern population.

Figure 3A shows the work months of employment during the construction phase at Norman Wells. You will notice the peaks and valleys of employment, with the third and fourth quarters of each year tending to be the busiest. You will also notice the percentage of our workforce which was northern; at Norman Wells, this peaked at about 45 percent. The accompanying pie chart in Figure 3B shows that these people came from all over the North.

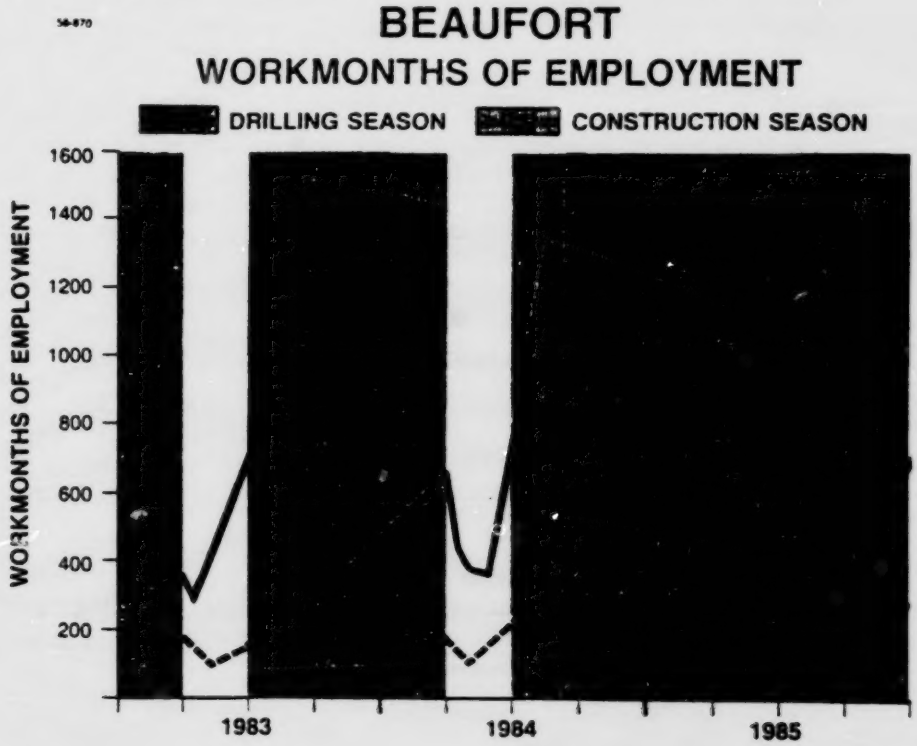

FIGURE 4A -- BEAUFORT WORKMONTHS

BEAUFORT EXPLORATION AGREEMENTS
RECRUITMENT PERCENTAGES BY COMMUNITY
1984

FIGURE 4B -- BEAUFORT RECRUITMENT

There are two similar graphs for our Beaufort exploration program. The first, Figure 4A, shows the work months of employment—and demonstrates the same fluctuations in demand. Esso's work in the Beaufort is particularly variable, as our needs rise in the summer when we are building artificial islands and land-based structures and again in the winter as drilling begins in earnest. The drilling and construction seasons are highlighted on the chart, and you will notice that there are periods between the two seasons where there is little work at all. Again, the accompanying pie chart in Figure 4B shows that for the Beaufort, our northern workforce -- 35 percent -- also comes from a widely dispersed area.

A number of other factors contribute to the fluctuation in labour needs and to the limited supply of workers. The first of these stems from the nature of oil and gas activities.

There are three phases in every successful project: exploration, development and production. Exploration is unpredictable -- your luck in finding oil or gas determines, to a great extent, whether a project will continue and how. Exploration is labour-intensive; it employs support services and construction crews. If exploration results are promising, you move into the development stage. This is also a period of high employment, involving the drilling of production wells and the construction of surface production facilities; this stage of a project lasts from two to four years. Finally, if you are successful in developing the resource, production can last from 15 to 30 years. This phase, however, employs approximately 10 percent of the staff required during the earlier phases.

A second factor is the legislative setting, which also affects the way a project is developed. As outlined in Figure 5, there are federal and territorial laws to comply with, and the communities have their own regulations -- and desires -- which must be taken into account.

Federal regulations are administered through the Canada Oil and Gas Lands Administration and also through the federal Department of Indian and Northern Affairs. In consultation with these and other federal departments, the oil industry

carries out its commitments to provide opportunities for the development of northern businesses and to offer employment to northerners. These commitments include special measures to increase the participation of disadvantaged groups in oil industry activities—measures previously called "affirmative action" and which are now considered under "equality of employment" legislation.

The territorial governments participate in decision-making as partners in all consultations and through special groups such as the Development Impact Zone societies.

FACTORS IN THE CHOICE: TOWNS OR WINGS

- **LEGISLATIVE SETTING**

FEDERAL	– CANADA OIL AND GAS ACT (EXPLORATION AGREEMENT)
	– INDIAN AND NORTHERN AFFAIRS (SOCIO-ECONOMIC AGREEMENT)
	– EQUALITY OF EMPLOYMENT
TERRITORIAL	– ENERGY, MINES AND RESOURCES
	– RENEWABLE RESOURCES
	– ECONOMIC DEVELOPMENT
INUVIALUIT	– INUVIALUIT REGIONAL CORPORATION (WESTERN ARCTIC LAND CLAIMS SETTLEMENT)
COMMUNITIES	– COUNCILS, HUNTERS & TRAPPERS ASSOCIATIONS

FIGURE 5 -- LEGISLATIVE SETTING

The Inuvialuit of the Western Arctic have recently been awarded surface and subsurface rights to certain lands in the North; the Inuvialuit have their own regulatory requirements for oil and gas operations on their lands.

The councils of the northern communities and the associations of hunters and trappers are two other groups whose interests must be considered. Esso has maintained extensive, ongoing communications with the members of these groups.

Esso's socio-economic policies—its desire to act as a good corporate citizen—also affect our business operations in the North. As Figure 6 indicates, our efforts are substantial: business development; employment; training and development of Northern employees; transportation; consultation; and impact mitigation. Why does Esso have these policies? Not only do we desire to be a good corporate citizen . . . these policies also make good business sense in the long run. We want to be able to deal with suppliers that are close by and we want to be able to hire skilled workers from the towns or villages near to our operations.

58-474

FACTORS IN THE CHOICE: TOWNS OR WINGS

- **ESSO'S SOCIO-ECONOMIC POLICIES**
  - **NORTHERN BUSINESS DEVELOPMENT**
  - **NORTHERN EMPLOYMENT**
  - **TRAINING AND DEVELOPMENT OF NORTHERN EMPLOYEES**
  - **NORTHERN TRANSPORTATION**
  - **COMMUNITY CONSULTATION**
  - **IMPACT MITIGATION**

FIGURE 6 SOCIO-ECONOMIC POLICIES

A discussion of the factors contributing to uncertainty in development of the North would be incomplete if it did not mention the impact of public hearings, noted in Figure 7. Justice Thomas Berger's hearings in 1977 and the subsequent moratorium on development is one example. The Beaufort Environmental Assessment Review, held between 1981 and 1983, cost the oil industry an estimated $14 million in preparatory work and activities. Events such as these are further examples of why it is difficult for oil companies to plan and schedule their activities.

The nature of exploration and production development . . . the legislative setting . . . public hearings . . . These factors explain why flexibility is of paramount importance in our Northern operations. Added to these factors are Esso's socio-economic policies and the thinly-spread population of the North. Together, they explain why we draw our workforce from such a wide area.

58-475

FACTORS IN THE CHOICE: TOWNS OR WINGS

- **OUTCOME OF PUBLIC HEARINGS**
  - **NORMAN WELLS**
  - **BEAUFORT**

FIGURE 7 -- PUBLIC HEARINGS

In choosing between towns, wheels or wings in the Western Arctic, our decision is based upon flexibility and the desires and interests of the stakeholders in the North.

As summarized in Figure 8, industry wants cost-effectiveness, safety, reliability and the freedom to implement its own operating policies—technical as well as socio-economic. Industry also wants the flexibility to adapt to unpredictable exploration results, and changes in the political environment.

Northerners want to be involved . . . but on their own terms. They are not prepared to move from their communities and start new homes with each new prospect. They want the best of both worlds, and it is hard to disagree with that intent. Northerners want income and training, and they want hunting and trapping. They also want to avoid the highs and lows that -- all too often -- seem to accompany operations run by southerners.

Southerners want to work and earn a good living, but they do not want to buy a house that cannot be sold two or ten years in the future.

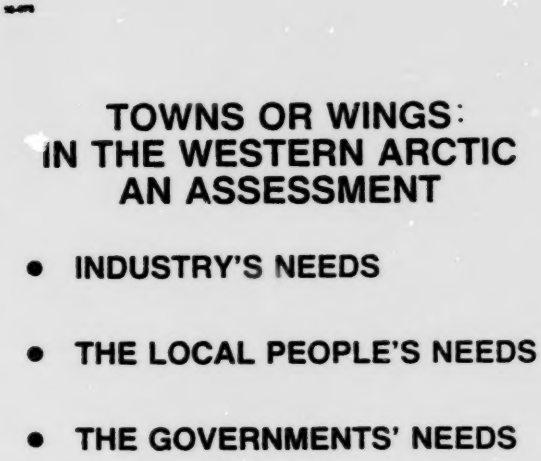

FIGURE 8 -- TOWNS OR WINGS

And governments want to see the resources of the North developed, but they are not in a position to carry the financial burden of such development alone.

The factors affecting northern resource development and the desires of the different parties indicate that building new towns is not the preferred alternative. I have barely touched on the socio-economic, political and cultural concerns, the effect of land claims settlements, and the emotional cost of beginning new towns and the risk of having to abandon them when prospecting opportunities decline.

We accept that commuting has its drawbacks and social costs, too. But for oil and gas companies operating in the current territorial settings, new towns are clearly not the answer. They carry too great a risk; they make it difficult to adapt to business cycles; and they infringe on native and northern lifestyles.

From Esso's viewpoint, commuting responds to more of the needs of the majority of stakeholders than any other option.

E. Question Period

Question: Fred Nogas, could you please elaborate on the salary system used at Rabbit Lake?

Answer: Very simply, we paid everyone on a salary basis. We set up 14 occupational classifications covering the mine operators, mill operators and service crew. They were hired on the basis of an interview and depending on their experience, they came in at a certain agreed rate. They progressed according to their ability. We had set up specific programs; for example if a mine operator came in with only the basics (if he could only drive a haul pack), once he got to operate one, two or three pieces of equipment to the satisfaction of his foreman and a training advisor, he would move up. In other words, you advanced by merit and ability. Theoretically, every man and woman on site could go up to the top rate. They did not have to wait on seniority or openings, etc. They were paid based on an eleven hour day, on a monthly rate, and if they missed time for illness or anything of that nature, they did not lose any pay. It was not a punch clock operation.

Question: John Batteke, in commuting through Tuk and Inuvik, were there problems with local populations when the crews stopped over on the way in and the way out?

Answer: No. There were no problems because they did not stop over on the way out. The distance from Edmonton to Inuvik is perhaps not very much less than from Edmonton to Toronto but when the crew arrived in our terminal, the Otter was waiting to bring them to Tuk.

Question: Hank Giegerich, does Cominco rotate supervisory staff at Polaris?

Answer: Yes, we do. The very senior staff have slightly a shorter schedule than the others because they are expected to stop in the office and do a bit of work during their rotation.

Question: There is a second part of that question, Hank. Are married couples allowed to live on the site if they so desire?

Answer: Not only are they allowed, they are encouraged. We found out in Greenland, and even to a greater extent at Polaris, that married couples add stability, certainly interest, and definitely charm to an isolated operation and we strongly encourage them. (Do they all work?) Yes, everybody works.

Question: To Larry Berg, although a new town was prohibited, could you have used a work camp with weekly rather than daily rotations and would helicopters be feasible with weekly commuting?

Answer: At that time when the Alberta Government put forth their coal policy, they disallowed temporary camp accommodations as well. Recent government policy

which deals with the eastern slopes of the Rocky Mountains has confirmed this prohibition.

As to the second part of the question, if you are only commuting weekly, the drive is hardly arduous and would certainly be preferable to the cost of helicopter service.

Question: To Hank Giegerich, what hours do the employees work at Polaris?

Answer: The average shift is about 11 hours a day, from changehouse to changehouse, except for the people on the continuous operations, such as the concentrator and powerhouse, where it is a 12 hour per day shift, as these are more of an attendant's job.

Question: To Fred Nogas, at Rabbit Lake how long is the commute and is time paid? The second part, what was the unemployment rate at the time?

Answer: The commuting time from Saskatoon is approximately 2 hours, that's including a stop at Prince Albert. This is what we call the sourthern trip and once a week they stop at LaRonge so it makes it about 2 hours and 20 minutes but the average trip is 2 hours without that LaRonge stop. We are using F27, 40 passenger, turbo prop aircraft.

The northern commute is anywhere from 1-1/2 to 2 hours because the route is basically from Fort Chip/Uranium City/Fon Du Lac/Black Lake/Stoney Rapids. Then there is a short commute to Wolliston Lake twice a week and that is less than 1/2 hour.

No, there is no such thing as travel time because workers are paid on a salary basis. If you travel 2 hours, or if there are times when the weather delays the plane and you may sit on the ground and be 3 or 4 hours late, you are paid the same, so there is no such thing as travel time.

Question: To Larry Berg, a two part question, what did the road improvements from Edson to Sterco cost the Alberta Government?

Answer: I do not know Rod, what the road improvement cost. However, the road was not associated purely with our development; it went beyond the mine into Nordegg and Rocky Mountain House in central Alberta.

Question: The second part of this question to Larry Berg, then, was there any consideration given to a government grant to support the helicopter service rather than sinking the money into the road?

Answer: We did not apply for a grant so there was no consideration in-house to do that.

Question: This one is for Hank Giegerich: does Cominco provide free transportation to the Polaris site, and what, if any, charges are there for the employee living on the site?

Answer: Yes, we supply free transportation from any commercial airfield in Canada; that includes all the way from the Vancouver area right over to Newfoundland. As far as charges on-site, there are none. Transportation and room and board are free. I will rephrase that—not quite free—the federal government in its wisdom is seriously thinking about taxing the employees for these benefits.

Question: Fred Nogas, would you please discuss the nature of labour relations associated with the hiring compensation decisions. In particular, please explain labour's position, vis-a-vis employment of northern natives.

Answer: First, I will answer the second part of the previous question about the unemployment rate at the time of recruiting. It was probably the lowest in the country. I think that Saskatchewan traditionally had one of the lowest unemployment rates and back in the 1970s unemployment was relatively low in the West with all of the mega projects. Basically it was a tough, competive market as far as skilled people and professionals were concerned.

I am not quite sure whether the question dealing with the labour relations aspect asks what labour's position was in terms of our applicaton to the government for having longer hours, or just the relationship with labour in general. . .I will try to tackle it from my perspective.

In recruiting, of course, the employees came from the potash mines so they would all be steelworkers or mineworkers, but primarily steelworkers. We had no preconceived idea whether there would be a collective agreement on-site. Again, as I mentioned earlier, we stressed the consultative and the participative management style we wanted to be flexible, and we sought the advice of the employees. Keep in mind that we started with the top management and the first group to be hired after construction was the mine workers and service crew, thus we had a small nucleus. It was rather amusing that when the federal government ordered the Commission of Enquiry, after two or three days on-site, Stu Gunn got the management group together and said, "I think it's fixed. Everywhere we go they give us the same story. Don't change the eleven hour shifts or the seven and seven because we aren't interested in any other way." Maybe that answers your question.

There certainly were negative attitudes towards the proposal from the Saskatchewan Federation of Labour and the C.L.C. in general because as far as they were concerned it was a retrograde step in labour relations to go from a eight-hour to an eleven-hour day. They were concerned, as we were, about fatigue and absenteeism and many other factors. Of course, again, coming from the oil patch where eleven hour days were very familiar both in refining and offshore drilling, we at Gulf Minerals were sort of confident. As statistics show it was not a problem and is not a problem today.

Question: To all of the panel members: is there a maximum workforce size beyond which it is impractical or uneconomical to consider using the commuting option?

Answer: John Batteke - That is a difficult question. I can only tell you that at the peak operation at Norman Wells they had about 1,200 people and that size did not prove to be a problem.

Larry Berg - I would agree with John. I do not think it is a function of the size of the workforce. In my experience, the commuting option always concerned more the economics and the product and the distance. I do not know whether the size of the workforce is that much of a factor.

Fred Nogas - I certainly tend to agree with both Larry and John. We were asked this many times, by various consultings firms looking at projects in places like New Guinea, Columbia, Indonesia, where they were considering a workforce of 3,000 commuting by 747s. My answer was, "I really don't know. I don't know whether New Guineans like to travel by air." You have to consider attitudes and economics; the viability and the length of the project, the sort of product you have got, whether it is going to stand up in market; and the whole attitude towards flying.

Hank Giegerich - Well, in our operations I do not think we get anywhere near the workforce numbers that would be a problem. The other experience that I have seen is at Prudhoe Bay in Alaska, where they have been on a commuting system since they have been in operation, in the early 1970s, and they have had as many as 3,000 - 4,000 people commuting from Anchorage, and even from Seattle, on a one week in and a one week out basis—at the very most, two weeks in and two weeks out. It certainly is feasible and they have been doing it for a long time.

Question: To Hank Giegerich, what is the native turnover rate at Polaris and what proportion of them have proved to be steady workers over one year or longer?

Answer: I am not familiar with the recent numbers but the last numbers I saw were that the turnover rate for native people was two to three times higher than for non-native people. I do not know whether that still holds because my figures are about a year and one-half or two years out of date. As regards the native proportion of the workforce, we started out there with 25% of the people being native, got as high as 35%, but I understand now that it is down below that original level. I do think that they have found that there is a core of native people, probably running between 10 to 15% of the workforce, who have been very steady. One little interesting story: the native people are given the option of either the ten and two or the six and four schedule. Most of them take the six and four but a few of them have selected the ten and two. One of them did it purposely because he came to the supervisor and said he wanted the ten and two so he would not have to go hunting and fishing with his father, so not all Eskimos want to go hunting and fishing.

Question: Fred Nogas, how do you cover the two hours outside of the eleven hour shifts for continuous operation?

Answer: Basically, the day is divided into 2 periods: 7:00 a.m. to 7:00 p.m.; and 7:00 p.m. to 7:00 a.m. The crew coming on in the morning have had their breakfast and are ready to work as soon as the so-called night shift comes off. The mine operation can shut down with no problem. Basically this means eleven hours work and one hour for a meal whether it is at 12:00 noon or 12:00 midnight or 7:00 p.m. The mill operations (the majority of them) could come in on the shift's change and, together, could have their meals at regular hours. Now there are some in the power house and perhaps one or two others, that have their meals brought to them, whereas everything else on the project can shut down and you can make your change.

Question: Fred Nogas, does each employee have his or her own room to return to after a tour of duty?

Answer: Basically, each employee has his or her own room while in camp. We do not quite hot-bed, we hot-room, I guess. There are two beds in the room and two huge lockers so that each employee has their own bed and locker. The only thing they share is the room itself but not together; its use is rotated. That was very important.

Question: Hank Giegerich, I have a curve ball for you here. Can you comment on last night's news announcement that Pine Point is closing in two years because of the low price of ore and the prediction that easily-accessible ore will have been taken out by then? A group interviewed felt that Cominco should not cut-and-run.

Answer: Well I don't believe it's it is question of cut-and-run. We have been operating there for over 20 years now. Any mining operation—and that is the nature of the beast—involves a non-renewable resource. When it becomes uneconomic, you just cannot carry it on, and at the present time there is no doubt about it being uneconomic. Pine Point is trying to keep the operation alive, in the face of a disastrous metal market, but much of the mineral reserve at Pine Point is no longer ore. We have made country rock out of some pretty good mineral, and that unfortunately is one of the effects of economics and also, to a some extent, misguided policies, But I do not think that it is a matter of cutting and running. We cannot afford to lose money in an operation up there—I do not think that Cominco makes any bones about it—we are not a non-profit organization. We are in business to earn a profit.

Question: This is the last question and it is for Hank Giegerich. Were any cost comparisons made of new town versus fly-in options at Polaris and Red Dog? If so, what were the differentials?

Answer: We did not make any comparisons for Red Dog because the decision was made immediately by our partners, and we concurred, that there would be no townsite. We did do some preliminary studies at Polaris. The accommodation, or hotel as we called it at Polaris, cost $12 million and that was in 1981 dollars. The equivalent townsite would have cost somewhere between $20 and $30 million, not including some of the key infrastructure. For example, to my knowledge, I believe there has not been a school built in the Northwest Territories that has cost less than $5 million and that was the kind of figure we were looking at.

THE INDUSTRY SOLUTION

ROY E. LLOYD

I am grateful for the opportunity to commute to Vancouver from Saskatoon to participate in this conference. Commuting 1,500 km may be stretching it a bit, but living in Saskatoon and commuting to one of Saskatchewan's three operating uranium mines is similar to flights from Vancouver to Calgary, Edmonton to Saskatoon, or Regina to Winnipeg.

The conference is drawing upon the experiences of people who have been intimately involved in the "Towns, Wheels or Wings" choice. These experts will outline the detailed aspects of each alternative system. I want to share with you, tonight, the industry's perspective on using the commuter system to develop the Saskatchewan's world class uranium resource.

Before I turn to a discussion of the commuter system and its application to the Saskatchewan uranium industry, I should put that industry into perspective.

Though best known as a wheat exporting province, Saskatchewan is also a major world supplier of uranium. In fact, the province accounts for about the same percentage of the world's trade in both commodities—about 20%.

Saskatchewan has two of the world's richest known orebodies at Key Lake and Cigar Lake. The Key Lake project went into full commercial production in 1984 and last year produced more than 11 million pounds of U_3O_8. The Cigar Lake deposit is at the pre-development phase and if all goes according to schedule, could be in production in the mid-to-early nineties. In addition to the mine at Key Lake, Saskatchewan has the Cluff Lake uranium mine and the Rabbit Lake/Collins Bay mine with combined 1985 production of about 3 million pounds.

Saskatchewan production in 1985 was approximately 16 million pounds or about 20% of world production and more than 50% of Canadian production. Saskatchewan's uranium in 1985 had an estimated value of more than $400 million generating government royalties of about $20 million. The industry employs some 4,500 people and is the only large-scale industrial employer in northern Saskatchewan.

Each of the three operating mines chose to opt for the commuter system. Why, you would logically ask? From a project profile point of view, the three projects each had a number of things in common:

(1) All tnree projects were remote from major communities and virtually no infrastructure existed to support an industrial enterprise. Indeed, the all-weather roads to these projects were largely built and paid for by the developers and served the purpose of providing road access to communities which had been isolated prior to the time when the projects proceeded.

(2) All three projects had finite ore reserves at the time when the development decision was taken. Gulf Minerals, in taking the decision to develop Rabbit Lake, had defined reserves which could be mined out and processed over a 10 year period. Similarly, Cluff Lake's ore reserves pointed toward a 12 year program while Key Lake had ore reserves for a 15 to 20 year lifespan depending upon the rate of exploitation.

(3) The grade of the ore in these deposits, relative to what was being mined in the industry world-wide would indicate that such developments should fall well below the average cost of production in the industry thus making such projects highly competitive in the international market place.

(4) The remoteness of the projects and their finite life also suggested other things to the developers. The projects would be faced with relatively high fixed costs. Optimization of earnings would be dependent upon the project's ability to produce at target levels. Downtime and low productivity could seriously damage the economics of the projects. This was particularly true with Key Lake and Cluff Lake where interest rates were at historical highs when the projects were developed.

(5) All tnree projects were uranium projects. While every industry must strive for public acceptability if it is to survive and prosper in today's society, uranium producers must begrudgingly earn their acceptability in a hostile environment. Not only must we overcome those whose ideal is the no-growth nirvana, but we must provide that extra social benefit to balance off the fact that our end product—nuclear power—is a mystery to most in our society. You cannot see it, taste it or feel it, but it is powerful and could be dangerous. Indeed, the alleged nuclear weapons linkage is one which we have great difficulty overcoming.

(6) Finally, from a pure capital viewpoint, the options were very similar and if anything, slightly favouring the townsite alternative.

With this as background then, what were the factors which caused all three projects to be developed on the commuter basis?

While I cannot speak for the Gulf decision—and that is dealt with by Fred Nogas—I was directly involved on the industry side with both the Cluff Lake and Key Lake decisions. Basically, the **two** major issues were **productivity** and **public acceptance.**

Productivity

Given what I have mentioned previously about the specific profile of these projects, it was clear that to maximize the returns from these developments, a stable workforce would be required. The problems which have plagued remote one-industry towns are well know. Simply put, the towns have been plagued with high turnover rates. The reasons for this are open for speculation:

(1) Was it that the remote location drew a transient workforce in search of instant riches and with no roots or sense of attachment to the project and its success?

(2) Was it the high costs of living associated with isolated communities?

(3) Or the likelihood of cabin fever setting in, particularly for the families of the miners?

(4) Or concern among the families for educational opportunities as the children grew older, creating pressures for skilled workers and tradesmen to migrate south?

In addition to the stability of the workforce, the single industry, remote community option played havoc with the role of the mine manager. The position of mine manager becomes a monumental task requiring skills ranging from mayor to marriage counselor and consumer advocate or apologist for the company store. All these roles tend to distract from the central function of running a mine to achieve target production levels in a safe and effective manner.

Public Acceptance

Let me now turn to the question of public acceptance. Northern Saskatchewan is very sparsely populated with only 35,000 people living in the northern half of the province. The population was and is composed largely of native peoples who are dependent upon traditional lifestyles and social assistance as their life support system. Unemployment in a statistical and economic sense was over 50% in most of the settlements. Educational levels were much lower than in the south and skilled tradesmen were virtually non-existent in the population.

This was also a period when there was growing pressure for participation in development decisions—if not complete control over such decisions—by the native leadership. If there was to be development in the north they wished to participate.

The Saskatchewan government was well aware of these pressures and in the mid-seventies established the Bayda Inquiry to look at all aspects of uranium development and to determine whether it should be allowed to proceed. The Inquiry's findings on all grounds—economic, ethical/moral and social—were that development should be allowed to proceed. However, the challenge was that a high percentage of the related jobs should be filled by northerners and that northern business enterprises should be fostered to service such projects in both the development and production stages. From an industry perspective, the climate was appropriate for consultation and cooperation.

Gulf Minerals had already opted for the commuter system. This approach was popular for southern as well as northern employees and enabled the company to attract a number of people involved in farming into the workforce at the Rabbit Lake mine while at the same time maintaining their farm enterprises.

Then in 1978, the Cluff Lake Board of Inquiry recommended a Surface Lease—an agreement between the company and the landlord, the Government, that would outline the operating conditions. One condition stipulated a 50% northern component to the workforce.

The commuter system provided an opportunity for a large number of northerners to work without relocation. Studies had indicated that it was difficult to relocate native people—they would gradually migrate back to their original location. Besides the commuter system would better fit into their lifestyle; they could still maintain their trap lines and fishing activities. A seven day rotation seemed appropriate—7 days of work followed by 7 days off. A vote of workers at the Cluff Lake site in 1979 indicated 96% support for the 7 days in/7 days out cycle.

In terms of public acceptance, another benefit of the commuter option was that the approach would not result in the dislocation associated with the abandonment of a modern townsite when the economic base for it ceased to exist—that is, when the ore body was depleted. Since the roots of the workers would be in other, more diversified communities, the dislocation associated with the closure of the mines would be normalized and spread across a much broader base. Furthermore, the patterns for the delivery of social services by government in the region would not be disrupted, and the costs of decommissioning a whole town, and the attendant government services for the region, would be avoided.

The die was cast. The commuter system would make it possible to have a high percentage of northerners in the workforce. It would have a minimal effect on the lifestyles of employees. It would require no decommissioning of a townsite at the end of the mine's life. Furthermore, it would allow a mine manager to do his job—production—without having the concerns related to a company town.

Operations

How does the system work?

Each of the three operating mines use Saskatoon as a primary pick-up point. In addition, other communities from geographical areas of the north influenced by each particular mine are designated as pick-up points. Rabbit Lake pick-up points are in the Lake Athabasca area; Cluff Lake pick-up points are on the west side and northwestern area of the province; and Key Lake pick-up points are from the central and east side areas of the north. The aircraft range from a 50 seat Convair to a 5 seat twin engine plane. Both Rabbit Lake and Cluff Lake move a workforce of approximately 300, while Key Lake exceeds 400 on its weekly rotation. A number of small local airlines are used by all three companies in addition to the major carrier out of Saskatoon and Prince Alberta.

As one can appreciate, the operating requirements of the mines and the flight logistics of transporting 1,100 employees per week between three mines and 20 communities are complex, but the system is manageable. For example, Key Lake's commuter schedule operates as follows:

Day	A-Shift (In)	B-Shift (Out)
Monday:		
Saskatoon - Prince Albert	37	37
Tuesday:		
Saskatoon - Prince Alberta - LaRonge	48	47
5 northern towns (2 flights)	9	11
	57	58
Wednesday:		
Saskatoon - Prince Alberta	47	47
Thursday:		
Saskatoon - Prince Alberta - LaRonge	50	46
3 northern towns (2 flights)	7	12
	57	58
Friday:		
Saskatoon - Prince Alberta	30	28
5 northern towns (1 flight)	5	6
	35	34
	233 In	235 Out

With the seven days in/seven days out system and 11 hour shifts, certain factors become critical to maintaining a productive workforce. Perhaps the most important is food services. As anyone associated with camp life in remote locations knows, the most important man or woman on site in terms of the productivity of the workforce is the cook or chef.

All three mines have pleasant accommodation and services. In fact, the Key Lake facility is the largest "hotel" in Saskatchewan. The workers have individual rooms which they share with their cross shift.

All sites have full-time recreation staff who plan activities for non-working hours. Cluff Lake has held coaching clinics to upgrade skills of participants so the skill can be used in the home community (e.g. a golf pro gives lessons). In addition there are various clubs organized (such as photography), there are gym facilities, a curling rink, and tennis courts. In addition, there is cross-country skiing and fishing. Key Lake is now looking at personal growth training (academic and skill-upgrading) through courses from a community college or the Northern Institute of Technology.

To address another aspect of worker motivation, each of the mines has established the practice of bringing the worker's family to the mine site for a day each year. This allows the family to understand where Mom or Dad works every second week. A lot of the complaints about the quality of food disappear after the family has visited the camp.

In terms of costs, the all-inclusive cost for wages, salaries, benefits, accommodation, food, recreation and air transportation is about $100,000 per employee. Of that, commuting costs account for about 5 percent.

Workers' Experience

The commuter system appears to be compatible with the lifestyle of both northerners and southerners. All three companies have noticed a net migration of northern employees from their home communities to southern centres such as Prince Albert and Saskatoon. Eldorado estimates that about 1/5 of their present local northern workforce has relocated to either Prince Alberta or Saskatoon. This is similar for Key Lake and Cluff Lake as well.

The mines have found that it is easier for the native worker to orient to the job when he/she is on site and without the family. The employee is able to work without community distractions. Now that the commuter system is established, absenteeism is down by 75% compared to six yars ago.

The Record

What has the record been? Has the system achieved the goals which led to its adoption? Basically, the objectives which the industry had set out to achieve were:

(1) a stable, productive workforce,
(2) a high proportion of native northerners, and
(3) minimum social and economic disruption upon mine closure.

I shall deal with the third objective first, since it is easiest. The fact is that we do not yet know the impact of decommissioning the commuter system, since additional reserves have been found at Cluff Lake and Rabbit Lake, which will see these projects, like Key Lake, in operation until the next century.

As regards stability, real progress is being made. Eldorado estimated in 1985 that labour turnover was less than 3%. Cluff Lake turnover, after being as high as 100% for the first year, gradually dropped to 13% in 1984 and was negligible in 1985. Given that Phase II of the project will require less manpower than Phase I, Cluff Lake had hoped to avoid the layoff problem through attrition, however, finally it became necessary to make the layoffs since turnover was almost zero. Key Lake, the latest of the developments, is still experiencing a slightly higher turnover rate, but that has now dropped to about 17% and we expect it to continue to improve as the workforce matures.

In terms of northern native participation, again, real progress has been made. Cluff Lake leads the way with just over 50% of its total workforce made up of native northerners. The comparable figures for Key Lake and Rabbit Lake are just under 30%. At Key Lake, all entry level employees are native northerners and the greatest shortfall from the objective is in the maintenance area where skilled tradespeople are required.

From an operating perspective, while the short overlap of shifts on changeover days still remains a challenge, it has not created any insurmountable difficulties.

In conclusion then, if you were to ask any of the Saskatchewan operators or the owners of these projects whether they would opt for a company town if they had it all to do over again, I am sure the answer would be a definite "NO" !

A. Settlement Options for Resource Development in Australia

Peter W. Newton

In Australia, as in Canada, the mineral industry has been a major factor in the nation's economic development, currently contributing 6 percent of GDP compared to 10 percent for Canada. Over the past 30 years the industry has been the main stimulus to development of new settlements in non-metropolitan areas in both countries, especially in the more remote and climatically harsh northern and western regions. In Australia, virtually all the resource projects initiated during the mining boom of the 1960s and early 1970s were associated with the construction of small towns designed to service resource extraction in isolated settings. Other settlement alternatives, such as the "combine town" or "commuter mining" were given little or no systematic consideration by mining companies or government (in relation to criteria such as their relative effectiveness, costs of implementation etc.), although some attempt was being made to challenge the inertia surrounding the mine-singletown nexus (Brealey and Newton, 1977, 1981; Newton and Brealey, 1979).

This situation is beginning to change both in Canada and Australia. In Canada an underlying cause seems to have been related to the spate of closures or temporary shutdowns that occurred in single industry resource communities during the global recession in the early 1980s. Concern has subsequently centered upon identifying programmes to alleviate the hardship faced by residents of the affected towns as well as policies designed to create more resilient mining communities in the future (Centre for Resource studies, 1984). No comparable closures occurred in Australia, although there was contraction of the resources sector as a result of a decline in global demand for mineral and energy resources coincident with increasing competition from other mineral exporting countries (Brazil for iron ore, South Africa for coal and Brunei for natural gas). Instead, deferral or abandonment of proposed projects—59 in all during 1981-82— were the norm in Australia (ACIR, 1984, p. A. 13).

The spate of mining town closures in Canada in the early 1980s clearly demonstrated that the manner in which the workforce of a particular resource project is housed can have a major impact on the way the benefits and costs of such projects are distributed, both in the long and short run: between individuals, regions, private sector corporations and between the different tiers of government (CRS, 1984). The underlying problem that this conference deals with, and the present paper attempts to address, is whether it is possible to do a better job of resource town planning in the future than has been the case in the past.

To do so it is necessary to identify:

(a) the range of settlement options available to non-renewable resource development projects in remote settings,

(b) the principal interest groups in resource development, which comprise the mining company, the work force, government (at all levels) and the community in which the work force is located, and

(c) the criteria to be employed in assessing the economic and social viability of a specific resource project.

Some would argue that evaluation should extend to a wide-ranging analysis of the political-economic environment of particular mineral development proposals, incorporating such criteria as: the international market structure of the minerals involved; the institutional framework of the project; the geographical orientation of sales; and the projected tonnage of production (Wallace, 1984). There is considerable merit in this idea and examination of these factors is likely to provide a measure of explanation for the differential impact of the recession on the resources sector and the resource settlements of the two countries. However, such an examination is clearly beyond the scope of this paper.

It is a relatively straightforward matter to identify the four principal settlement types that have been associated with extraction of non-renewable resources in remote areas in Australia.

1. **Single Enterprise Towns** Until the early 1970s, construction of new mining towns was one of the few possibilities considered to meet the living requirements of a remote resource project. Such towns vary in size from around 1000 persons to over 5000, depending, in large part, upon the magnitude of the deposit the town was designed to serve (e.g. Newman). For purposes of the present discussion, all are grouped together since, in the final analysis, the deposit(s) upon which they are based is finite. They conform to DePape's (1984) criteria of being associated with a single mining project, whether it be one mine or group of mines in close proximity, operated by the same company. Detailed descriptions of such towns are found in Newton (1981) and Newton and Brealey (1983).

2. **Combine Towns** Such towns have an economic base supported by one major industrial project, of which at least one is a mining project. It is possible to differentiate two variations within this category of diversified town, namely, where there is pre-existing settlement which is either mining or rural based (e.g. Leeman, W.A.; Capella, Queensland) or where the existence of several orebodies within the same region provide a basis (or potential) for co-ordinated development (e.g. Moranbah

in the Bowen Basin of Central Queensland—see Sharma, 1983 for a description of this class of town; or the proposed Hamersley Range central township in W.A. - see Pilgrim, 1986). Daily commuting from the township to the minesite(s) is the norm.

3. **Fly-In** Long distance commuter mining has arisen in a number of resource development contexts where workers are flown to the site for an intensive period of work (typically 1 to 3 weeks), living in barracks-type accommodation, then returning for some corresponding period of time off, living in accomodation in urban areas which they provide for themselves.

4. **Relocatable Communities** While there are several examples of mining communities in Australia which have been relocated in order that minerals be extracted from underneath the township—basically an example of a poor initial decision about the siting of the town, e.g. Leigh Creek, S.A.; Yallourn, Vic.—there are few examples of post-war mining communities designed to be relocated at the cessation of mining activity at a particular location. An exception is Shay Gap, whose housing was factory-built in modular form capable of being dismantled and reassembled (see Newton, 1985). Built in 1968 the town remains in operation, despite several threatened closures. The principal weaknesses of this option centre upon the technological and physical obsolescence of the buildings by the time of relocation and sale, and the problems of timing closures and commencements.

It is a more difficult task to identify those factors which demand examination as to differential impact under the three principal settlement/accommodation options. The body of research undertaken to date provides a wide spectrum of measures:

- administration (Lea and Zehner, 1983; Lea, 1986);
- infrastructure provision (Linge, 1980; Trengrove, 1981, ACIR, 1984);
- industrial relations (Veno and Dufty, 1985);
- quality of life in communities (Brealey, 1980; Burvill, 1975; Stockbidge et al., 1976; Neil et al., 1983);
- native land rights (Cousins and Nieuwenhuysen, 1984);
- environmental protection (Fowler, 1982).

The task of this paper is to examine such factors in respect of whether a particular settlement option confers benefits or disbenefits to the four interested parties in resource development, namely: government, mining companies, the mining workers and the residential communities in which they and their families live.

Government's Role in Resource Settlement Policy

Governments influence patterns of mining development, and in particular the manner in which the workforce of a particular resource project is to be housed, through their decisions about the provision and financing of infrastructure. The strategies which governments (at state and federal levels) can adopt in relation to infrastructure provision are threefold (after ACIR, 1984 pp. 37-45):

1. **Free Market Approach** This constitutes a private enterprise perspective which views mineral exploration and extraction as the preserve of industry in response to the market. A minimal role is envisaged for government, limited to such functions as providing security of tenure, a favourable macro-economic environment in regard to trade barriers, exchange rates, taxes etc., with returns to developers reflecting an appropriate compensation for risk.

2. **Developmentalist Approach** This approach is characteristic of a mixed economy, where governments adopt an entrepreneurial role in terms of providing infrastructure—usually urban and social infrastructure which includes roads, serviced allotments, sewerage, town water, health and welfare services, education etc., but in some instances industrial infrastructure as well such as power, rail, communications etc.—incentives and concessions to encourage development.

3. **Nationalist Approach** A fundamental premise here is that ownership and control of, as well as benefits from, mining developments should be retained within the resource-producing country. This involves the central government using its constitutional powers to over-ride the regional interests of state or provincial governments and the essentially economic interests of mining corporations, in order to ensure that appropriate returns accrue to the resource regions and the nation as a whole for the exploitation of its non-renewable resources. There are many facets to this approach, but from a settlement perspective, a nationalist approach by government presumes the power to control the timing, location and nature of new resource developments, not only by blocking undesirable projects, but by initiating new ones.

An overview of postwar resource development within Australia indicates that governments at both federal and state levels have, at different times, depending upon prevailing economic and political circumstances, adopted aspects of all three approaches to the provision of infrastructure and other forms of assistance to the mining industry. Indeed it is possible to associate, albeit speculatively, the three principal state development philosophies with the dominant approaches towards resource-based settlement, namely:

developmentalist	- new towns	(1960, which marks the beginning of the postwar minerals boom, through the early 1970s)
nationalist	- combined towns	(mid to late 1970s)
free market	- fly-in	(1980 onwards)

This in no way implies exclusivity with respect to state philosophies/settlement options, but based on what was developed over the past 25 years and what is currently proposed, it captures a dominant tendency.

Factors Predisposing Development of Single Industry Towns

1. Historically there was an absence of settlement in the regions where the initial ore bodies were developed in the early 1960s. The ore bodies were in scattered locations and there was no reason to place townships anywhere but in close proximity to the mine. Furthermore it was not until the mid-to-late 1960s that offshore mining for oil and gas was established in the Bass Strait region in Australia (coinciding with North Sea activity) and undertaken for several years by boat, which meant that there was little or no prospect for diffusion of this particular innovation to on-shore mining companies at the outset of the minerals boom.

2. The period when the first spate of new mining towns were being developed (late 1960s, early 1970s) also coincided with the period when urban policy debate in Australia was consumed by identifying the most efficient and equitable means of accommodating the population growth which was expected to occur over the next quarter century. The major cities were seen to be the principal recipients and there was a school of thought (AIUS, 1971, 1972) which viewed increased population in cities such as Sydney and Melbourne as economically inefficient, especially with respect to provision of infrastructure; and socially undesirable, with respect to a range of personal pathologies. In a sense this 'new cities' movement was distinct from longer

established State government-based decentralization policies, which traditionally had not been seen as a means of siphoning population off cities, but rather as a means of enhancing the quality of life of under-populated regions—because increased population affords a higher standard of facility provision.

In this context, it is clear that construction of new mining towns was positively received by government at both state and federal levels as one means of advancing their dual urban policies (Connor, 1974). By the late 1970s, however, a changing pattern of urbanization had been identified in the United States as well as in the UK and parts of Western Europe (Vining and Kontuly, 1978). Evidence of similar trends were emerging in Australia (Hugo, 1983) and Canada (Hodge, 1983). The principal features of the changing settlement pattern were: a marked slow-down in the growth of large cities, nascent inner city revitalization, and growth in non-metropolitan and rural areas. As policy shifts tend to reflect societal shifts, the imprimatur for the earlier growth centre and decentralization policies had weakened.

3. Australian governments at either state or federal levels did not possess sufficient capital to 'buy into' massive individual projects and participate directly in decision-making. Control was vested, for the most part in foreign-owned corporations with their own particular development philosophies (see 4. through 7. that follow). However, under a pervasive developmentalist ideology, which was characteristic of Australia during the 1950s, 1960s and early 1970s, (Newton and Sharpe, 1980, Harman and Head 1981), state and federal governments, under the terms of Indenture Agreements, undertook provision of 'state services' (health, education, law and order etc.) to the new mining communities while mining companies were required to provide virtually all the industrial and social infrastructure, although here the Federal government was providing a significant indirect subsidy for infrastructure via the company taxation system with its (100%) write off provisions (ACIR, 19984, p. 91). The Fitzgerald Report (1974) was later to question the benefits gained (by the Australian government) from the accelerated depreciation provisions available to the mining companies. This issue will be examined further in discussion of the combine town below.

4. Self-containment of individual companies' projects was seen to be a desirable attribute. This was believed to simplify management in that all mining operations, housing and town infrastructure in a particular location came under the same administation (Brealey and Newton, 1981). Management also point to the competition for skilled labour between companies in a joint town, suggesting that inter-company labour mobility is higher in multi-company towns that in separate single-company towns (Dedear, 1980).

5. Negotiated agreements between companies and governments required that companies finance and construct a significant proportion of the town infrastructure and many of the facilities normally provided by government. This had the potential for creating complications if more than one company were to occupy and share the cost of the town, particularly if they did not commence operations at the same time. Pancontinental Mining Co., for instance, has expressed dissatisfaction with certain of the planning decisions made at Jabiru in the Northern Territory. Pancontinental will be the largest of the producers occupying that town, but because its operations will commence considerably later than the others the company considers that it has been pre-empted in many of the decisions being made before occupying its part of the town (Brealey and Newton, 1981, p. 202).

6. Industrial relations were considered to be easier to negotiate when a single company workforce constituted the sole occupancy of the town. Couched in the context of U.S. industrial relations (e.g. collective bargaining, absence of a centralized arbitration system) it has been argued (Clark, 1981, p. 412) that by spatially isolating its workforce, the mining corporation is able to simplify its contractual negotiations and to assert its authority over unions regarding control over production and the conditions of employment. Veno and Dufty (1985) indicate, however, that company ownership of towns and facilities allows discontent by workers and their families to focus industrial disputation on conditions at a higher rate than in non-company owned towns.

7. Corporate image was seen to be enhanced by the construction of model towns and, in addition to their public relations value, they were used as a lure for prospective employees (Brealey and Newton, 1981). This is evidenced in company brochures and annual reports extolling the attractiveness of their towns. It seems to be a notion fostered by multinational resource developers, as Bradbury (1980, p.25) observes in the Canadian context:

> ". . .the awareness among large corporations of the public relations value of having their industrial operations carried on in a showplace community".

Even in 'open' towns (such as Hedland), the preference of mining corporations has been for large enclaves of company housing—as opposed to 'pepper-potting', a social-mix policy favoured by State governments. (See Syme and Illingworth, 1975.)

8. Physical planning as a cure for social pathologies is a concept which has attracted company managements and which has been purveyed by planners (Howroyd, 1974; Gribbin and Brealey, 1980). In fact the companies have seen fit to abrogate a good deal of the responsibility for much of the alleged social pathology in mining towns to planners (Brealey and Gribbin, 1980). If this concept were to have any chance of success, however, scope for experimentation had to be permitted and the planning experiments needed to be protected from contamination by interference from the ideas of planners other than the company-nominated one. The best medium for such experimentation was provided by a single company town. Links between the built environment and the social and psychological well-being of residents have proven difficult to substantiate, however (Gribbin and Brealey, 1980).

9. Phasing-in the development of different ore bodies in a region can create problems which lead to pressure from the first operator to commence mining to be permitted to establish a company town close to the ore body. Since several years or more could elapse before a second operation is established, miners attached to the first venture and accommodated in a centrally-located regional town would be faced with what many could construe as an unnecessarily long journey to work. Furthermore, whichever company went into the town first would have been financially committed to the construction of not only the infrastructure to meet the minimum requirements of its own anticipated community, but also some of the infrastructure necessary for the second company's workforce (Brealey and Newton, 1981).

The siting of a regional centre should be premised on a strategic plan for the development of the resources in the region (see Brealey and Newton, 1977). However, no such plan can be finalized when the selection of the next ore body to be opened up depends on the, as yet, unknown, specifications by foreign ore buyers for the different

types of ore available in the region. In the uranium provinces of the Northern Territory, each of several tenement holders intended at one stage to build its own small town at the ore body. A rationalization was effected (Cities Commission, 1973; Ranges Uranium Environmental Inquiry, 1977) and the regional centre of Jabiru was the result.

The Disadvantages of Small, Single Industry Towns

1. The population being too small to support adequate levels of services and amenities is a commonly expressed shortcoming of small, single industry towns (see for example Brealey and Newton, 1977). Of particular concern are the limited choice of shopping venues—usually monopolies, which have been granted by companies in order to attract the business to the town initially—and opportunities for entertainment and recreation. The standard of education and health care which can be provided is also severely curtailed if there is insufficient population to justify a full range of such services—but see Moriarty's 1981 proposal for a periodic market solution to the provision of services.

2. No alternative employment is available in single-industry, single company towns. Loss of a job requires moving from the town, and often the region. The lack of job opportunities for school leavers and those wives who wish to work is often cited as a reason why families leave small, single-company towns. (It has been argued elsewhere, however, that the shortage of jobs for married women who wish to work appears to be little different in remote mining towns than in the Australian community generally, Jones et al., 1981).

3. For the majority of residents in Australia's new mining towns the company is the sole landlord - allocating housing, specifying the manner in which it can be occupied, extracting rent (highly subsidized), undertaking all maintenance and requiring vacation of premises upon cessation of employment.

In 1979 this situation changed, at least for employees of the Mt. Newman Mining Co. resident in Newman and Hedland with the announcement of a company home purchase scheme. Three years after commencement of this scheme, some 30 per cent of Mt. Newman's housing stock in the two towns had been sold. (See Mr. Newman Mining Co. Pty Ltd. 1982 for details.) Subsequently normalization has proceeded in several other Pilbra mining towns. (Pilgrim, 1986.)

The company's stated objective in initiating the scheme was twofold:

(a) reducing their involvement in town management and house maintenance—the house purchase scheme forms a part of the town normalization process in the transition to local government, and

(b) a belief that, as in southern Australia, homeownership is associated with residential stability.

To these considerations can be added, perhaps, the fact that the company had fully depreciated much of its housing for taxation purposes by this time. The factors which motivate home ownership are, however, many and varied including: status, capital accumulation, security of tenure, satisfaction of life cycle-related demands, and unexpected length of residence in a particular locality. A recent study of the

early phase of the Mt. Newman home ownership scheme (Neil and Brealey, 1982) revealed that the decision to buy in Newman depended largely on the potential which home purchase in that town held as a means of capital accumulation, i.e. the extent to which the value of the asset appreciated in relation to the costs of rates and maintenance and interest foregone on sums allocated to mortgage repayments. The scheme had greater appeal to those households who anticipated a longer term stay in the town (six years or more) and who had not migrated to the town for expressly financial ('target') reasons.

It would appear, therefore, that in Australia (as opposed, perhaps, to Canada - see Paget and Walisser, 1984) there is not likely to be the problem of loss of private wealth in the form of accumulated homeownership equity when there is closure in single industry towns (due to guaranteed buy-back provisions on the part of the company).

4. Based on household surveys undertaken by the Commonwealth Scientific and Industrial Research Organization (CSIRO) over the past 15 years in more than 20 remote communities in northern Australia, resident evaluations of quality of life in single industry mining towns have pointed to deficiencies in the local social environment, in relation to such factors as: permeation of company influence throughout most aspects of life in the towns; limited opportunities for social contact with other than company employees and families; social stratification, and so forth.

Attempts have been made to quantify the responses provided by residents to open ended questions in order to thereby facilitate comparisons between different company towns, company towns and non-mining towns (Parkes et al. 1985, Newton and Brealey, 1983) - and with prospects for possible extension to commuter-mining workforces in future studies.

What quantification also provides is a balanced view of resident attitudes to their local communities, with a range of positive comments being associated with the built environment (at least for company employees), certain economic-employment aspects as well as community dynamics. On balance, Australian qualityof-life ratings tend to be lower than those found in the Roberts and Fisher (1984) Canadian study, although none of the communities studied in Canada was less than 10 years old—the converse of the Australian case studies, suggesting that with town maturation qualitative as well as quantitative changes occur in respect of the local population and living environment. (For a discussion of the life cycle of mining towns, see Bradbury and St. Martin, 1982.)

5. Socio-demographic imbalance is a common criticism of single industry mining towns, and those areas in which imbalance is most severe have been well documented in Australian and Canadian studies (Newton, 1981; Robinson, 1984). These patterns are not static, however, and as the mining towns mature, certain attributes change whereas others prove more resistant to change. The following examples are drawn from a longitudinal study of the demography of a sample of new Australian single industry mining towns in 1971 and 1981 (Newton, 1984):

(a) **Aborigines** The data indicate that Aborigines continue to be functionally irrelevant in resource development to the extent that they are excluded, for the most part, from mining company employment and consequently, residence in the company towns.

(b) **Age Structure** The new mining towns retain a more youthful age structure than older mining towns, reflecting company recruitment policies and higher levels of population turnover. There has been little change in the proportion of residents over the age of 50 years in the company towns, where until recently with the development of house purchase schemes by a number of mining companies, no accommodation has been made for retirees who wish to remain in the town. The loss of young people who leave to obtain secondary education continues to result in an under-representation of those in late-adolescence, with a corresponding lack of concern for the needs of this minority group. The 0-4 and 5-14 years cohorts reflect some maturation among resident mining town populations.

(c) **Sex Ratio** Levels for males remain higher than State averages across all urban communities, reflecting the component of single men in all resource projects workforces (at operations and construction stages). Within most new single-industry mining towns such levels have declined once the construction phase of development has passed and, also, as most companies have moved to recruit a greater proportion of married couples in preference to single men.

(d) **Birthplace** Single industry mining towns continue to host higher levels of foreign-born residents, although levels within towns have contracted markedly since the early 1970s. Increasing national and state levels of unemployment over the past decade have made it easier for mining companies to recruit staff from the domestic labour market.

(e) **Incomes** The new single industry mining towns in general, and those based on open-cut operations in particular, reveal higher levels of average household income than in the older mining and non-mining centres, highlighting the fact that mining does not disburse benefits equally even within its own sector.

(f) **Employment** The data on employment reveals a maturing of the new single industry mining towns as the operations phase of development (reflected in increased levels of direct employment in mining and transport with a decline in construction). Male participation in the labour force remains high for all new mining towns; female participation in the Pilbara company towns appears to have reached a ceiling for company towns at around 50 percent. Public sector activity has progressively and significantly bolstered the workforces of all centres including the new mining towns, belying the popular image of such regions as bastions of private enterprise.

6. Higher townsite infrastructure costs, particularly those concerned with central services are an obvious liability in small single industry mining towns compared with a combine town. There is little documented evidence on the quantification of these additional costs, although a study of the additional capital costs estimated to be incurred by building a separate company town for 2000 people rather than accommodating the proposed new workforce at Karratha (an established regional centre 50 km away) was put at $2500 per person, in 1985 dollars, based largely on the cost of distribution networks (electricity and water), and community buildings and facilities. (See Mannsell et al. 1970 as reported in Brealey and Newton, 1981).

7. Vulnerability of towns to closure with the attendant compulsory relocation of their residents is a characteristic of single company towns. This makes them more precarious places to live than towns in which there is more than one employer.

In an attempt to assess the effects of the forced relocation anticipated with the impending closure of the Goldsworthy Mining Ltd. operations in the Pilbara, certain questions were included in a CSIRO social survey conducted in Shay Gap in August, 1978. It was reported in the press that Goldsworthy Mining Ltd. would cease its iron ore operations in the Pilbara by June, 1981. A stratified random sample of 102 households (30 percent of the town total; refusal rate was zero) completed the core schedules (population, housing resident evaluation); 45 resident company employees completed the supplementary 'town closure schedule'. The results of the survey are fully outlined in Brealey and Newton (1981), but the main points are summarized as follows:

(a) Despite formal announcements by the company, residents remained uncertain how long operations would continue. (In fact, operations are still continuing; such is the uncertainty in the industry.)

(b) Degree of attachment to the community varied among the residents; 38 percent indicated they would not miss life in Shay Gap.

(c) Almost 50 percent indicated that a move would be disruptive; for one third, relocation would cause financial difficulties, as savings had not reached a target level.

(d) Two-thirds felt powerless in the face of impending closure; 70 percent had no firm plans for subsequent employment; however, 75 percent did not feel that the closure was unjust to residents or represented a reversal of undertakings given by the company.

Typically indenture agreements between state governments and mining companies go into considerable detail relating to the responsibilities of each party in undertaking development. Little or no consideration is given in such agreements to responsibilities associated with closure. Retrenchment agreements with relevant trade unions are more explicit in this regard (e.g. permitting employees to remain in occupancy for a certain period following their retrenchment; see Stewart, 1984).

The Advantages of Small Single Industry Towns

1. The lifestyle and community dynamics associated with residence in a small town appeals to a segment of the population in single industry towns.

2. The short journey to work confers obvious advantages to the employee, not the least of which is the availability of extra time for leisure pursuits or to be spent with the family. Also with short journeys to work there is no reluctance on the part of employers to provide transport, nor is it worthwhile for workers to claim travelling time. Longer hours can be devoted to the job by residents who, in the main, have been attracted by the prospect of making money. The fewer opportunities offered for leisure activities mean that workers are more apt to accept overtime when it becomes available (Brealey and Newton, 1981).

3. Town management is considerably simplified in single company towns, especially with respect to street and building maintenance, management of the housing stock and provision of services.

4. Innovative design concepts can more easily be pursued if the company is the sole owner of the town. For instance the many experimental initiatives embodied in the Goldsworthy Mining Ltd. town of Shay Gap, such as the exclusion of vehicles from the town interior and the disposition of houses without the demarcation of individual house lots, would have been difficult, if not impossible, to achieve if more than one employer had built the town (Brealey and Newton, 1981; Newton, 1985).

Factors Predisposing Development of Combine Towns

The 1970s brought a reappraisal on the part of the Australian federal government—in particular the federal labour government of 1972-1975 which could be characterised as holding a nationalistic ideology—of the benefits of mining activity to the community. A principal agent in this process was the Fitzgerald Report (1974) that focussed principally on financial (taxation) matters, and found that for a period of 6 years (1967-8 to 1972-3) the Australian federal government's net take from the minerals industry was a loss of $55 million, compared with state government receipts from mineral royalties of $263 million, and to the surplus accruing to foreign shareholders of the mining companies of $1024 million.

In addition, the relatively low employment in mining, the export orientation (with low levels of secondary processing), and the high level of foreign ownership and control all pointed to a much lower 'multiplier' benefit associated with resource development than had been initially anticipated.

It was against such a background, where the federal government in Australia (unlike the state governments) considered it was not maximizing the benefits from the minerals boom, that conscious policy decisions were taken (outlined fully in Connor, 1974) in relation to:

(a) Siting of mining towns. Under federal Labour policy, attempts should be made to establish towns designed to serve several mining operations close to each other, rather than several towns to serve each operation separately (which was the norm at that time). The new regional town of Jabiru in the Northern Territory remains as one of the few testaments to this policy, having been commissioned at a time when the Territory was subject to federal control. (Jabiru is to serve as dormitory to the 3 uranium deposits at Jabiluka, Ranger and Koongarra.)

(b) Integrated industrial development within the resource regions. Government was to seek a greater degree of mineral processing and related industrial development than had hitherto taken place (despite explicit requirements in most Indenture Agreements). Regional development departments were established (but disbanded after Labour lost office in 1975) and comprehensive regional industrial studies undertaken (e.g. for Pilbara, Bowen Basin regions) in an attempt to diversify the economic base of selected towns within the regions concerned.

Fundamental problems were inherent in both policy objectives. In relation to the first initiative federal taxation policy hampered development of combine (or centralized) towns until legislative changes were introduced in 1983 (almost a decade later). In relation to economic diversification in peripheral regions, it was becoming apparent by the mid to late 1970s that most major industries were being structured on a global-national rather than a national-regional basis. We now expand on both these issues.

Tax Deductions on Mining Company's Social Infrastructure Expenditure

It has always been the policy of Australian governments to encourage mineral exploration and mining and accordingly, special concessions to the mining industry have always been found in the income tax laws. A major amendment was enacted in 1968, and those provisions (with subsequent minor amendments) have proven central to negotiations between governments and mining corporations concerning issues such as the provision of infrastructure. Under the Income Tax Assessment Act, allowable capital expenditure is that made on site preparation, on buildings and plant connected with the mining operation, on provision of such infrastructure as water, power and on "housing and welfare" by which is meant (according to the legal definitions):

1. residential accommodation provided by the taxpayer at, or at a place adjacent to, the site of prescribed mining operations carried on by the taxpayer, being accommodation provided for the use of employees of the taxpayer employed for the purposes of the operations of the taxpayer on that site or operations of the taxpayer connected with those operations, or for the use of dependants of such employees; and

2. health, education, recreational or other similar facilities, or facilities for the provision of meals, provided by the taxpayer at, or at a place adjacent to, the site of prescribed mining operations carried on by the taxpayer, being facilities that:

   (i) are provided principally for the welfare of such employees or of dependents of such employees; and

   (ii) are not conducted for the purpose of profit-making by the taxpayer of any other person;

   and includes works carried out directly in connection with such accommodation or facilities, including works for the provision of water, light, power, access or communications. (CCH Australia Ltd. 1984: Australian Income Tax Legislation, p. 14, 683)

This definition would include expenditure on residential accommodation and social welfare facilities such as hospitals, medical and dental clinics, child welfare centres, libraries, technical colleges, schools, sports arenas, swimming pools, children's play centres, etc., provided principally for the welfare of employees or their dependants. Expenditure on buildings or other improvements for use in profit-making enterprises, such as shops, cinemas, hotels, etc., are not within the current definition.

The implications of the legislation as regards settlement relate to the interpretation of what constitutes 'adjacent' under the Act. The Federal Commissioner of Taxation has contended that a deduction should be allowable only when it related to 'wasting assets' unlikely to have any value after the working life of the mine (i.e. where housing was not provided in existing towns).

In the Bowen Basin region of central Queensland the presence of a number of small towns which existed to serve the sparsely populated pastoral region provided the Broken Hill Proprietary (BHP) Company Limited with an opportunity to attach their

workforce for the Gregory mine to either of two towns. The company chose to provide residential accommodation for its mine employees in the towns of Capella and Emerald, about 55 km and 65 km (or 3/4 hour travelling time), from the mine. At the time no other towns were closer to the mine. The BHP Co. Ltd. claimed that the employee's accommodation was at a place 'adjacent' to the mine. In the judgement of the Full Federal Court (Federal Commissioner of Taxation V. BHP Minerals Ltd., 14 July 1983, 4407) the accommodation was deemed to be 'adjacent' to the mine site and a deduction for associated expenditure was allowed. (The High Court also declined to hear a further appeal by the Commissioner.)

In summary, during the post-war period there have been a number of instances where major mining companies have been instrumental in achieving change to federal legislation necessary to facilitate corporate objectives. In the light of the 1983 Federal Court decision just referred to, greater flexibility now exists on the part of mining companies to consider daily commuting as a viable alternative for distances up to, and possibly exceeding 65 km from a mineral deposit (given the Court's judgement that the word 'adjacent' was to be interpreted broadly). Prior to that judgement (where it was generally held that 15 kilometres represented the accepted separation of mine and accommodation for taxation purposes; Waratah Gypsum v. Federal Commissioner of Taxation, 1965), federal tax legislation posed perhaps the strongest counter to any attempt by companies or governments to proceed toward a system of aggregated settlement for resource development in the more sparsely settled regions of Australia.

Secondary Processing, Regional Development and the Internationalization of Production

Decisions in the latter part of 1984 by two of Australia's largest industrial corporations BHP Co. Ltd. and Conzinc Rioginto (CRA) of Australia Limited, to invest heavily (several hundreds of millions of dollars) in overseas enterprises provide evidence of a recognition by Australian capital of a world economic system different from that in the early 1960s when Australia's first surge of post-war resource development occurred. In the pre-war period, mining was well integrated into the national economy with more than 70 percent of mineral exports being processed locally (Newton, 1983). Principal venues for processing were southeastern seaboard cities such as Newcastle and Wollongong, but a number of inland cities developed with dual extractive and processing industries (e.g. Mt. Isa in Queensland and Broken Hill in NSW).

With the proving of major mineral reserves in remote regions of northern Australia during the late 1950s and through the 1960s similar expectations were held by state (and federal) governments that mineral exploitation would be joined by secondary processing, adding value to the resource and providing a basis for regional development. The numerous government-funded regional development studies which had accumulated by the mid 1970s were testament to this policy perspective—also the expectations for secondary processing revealed in virtually all Indenture Agreements undertaken between mining companies and state governments in relation to individual resource projects.

The reality of this period was, however, that relatively low levels of local processing occurred, particularly in respect of iron ore. The venture by CRA is one designed to add value to the iron ore this corporation mines from the Pilbara, secure

their market for iron ore in the long-term against competition from Brazil, and gain access to latest technology via partnership in a separate technology development and licensing company—and thereby contribute to reversing the current pattern which has countries such as Australia and Canada as heavy importers of high technology products (Newton 1983). The settlement implications of this venture are also clear: the new steelworks is to be located in West Germany.

The factors of production which have given rise to this venture differ, however, from those operating in the aluminium industry, where Australia has attracted several aluminium smelters over the last 10 years. Australia's improved comparative advantage in the processing of bauxite—where, like iron ore, it is a major world producer—through to its final product stage—where its increase in value is around 1400 percent—Commonwealth/State Joint Study Group on Raw Materials Processing, 1981) is due to the energy-intensive nature of aluminium production and the internationally-competitive coal-based electricity generating costs which prevail in Australia. The extent to which these lowered costs are state-subsidized (through government funding of power station construction) has been the subject of continuing debate. The settlement implications are clear, however. Australia's principal coal reserves are located in the three eastern seaboard states in settled, non-metropolitan regions such as the Hunter Valley (NSW), LaTrobe Valley (Victoria) and the coastal area of Southeastern Queensland, and it has been these regions which have attracted the new aluminium smelters. The reasons for this pattern (as outlined by Linge, 1980 and Johns, 1984, p.4) generally relate to the fact that

> "capital expenditure infrastructure is less in relation to expanditure on the plant itself than would be the case with a remote mining operation ... Moreover, proximity to existing centres may mean that processing industry and its workforce can take up unutilized capacity in power stations, roads, dwelling, hospitals, schools".

A cursory review of the economic base of remote settlement in Australia reveals that only limited levels of processing/upgrading occur on site in the northern mining towns (e.g. benefication of iron ore, some refining of bauxite, concentration of uranium). Consequently, any decision to construct a new town with an expectation of attracting significant downstream processing and manufacturing industry would not appear to be well founded on experience to date.

The existing regional settlement system represents a necessary but not a sufficient condition for a centralized mining town. There are a number of instances where small communities nearby proposed resource developments have been discounted as a venue for new residential development. One example is Andamooka, a town of approximately 400 people 30 km east of the Roxby Downs uranium, gold and copper mine, where a nearby town is scheduled to accommodate up to 9,000 people has been discounted as a viable site (Roxby Management Services Pty Ltd., 1982, p. 2.61), the preference being for such small communities to gravitate to the larger new towns.

The development of coal mining in the Bowen Basin region of central Queensland over the past decade and the consequent development of several new mining towns in a region which could be classed as semi-isolated (being within three hours drive of regional centres on the coast) raised the issue of the appropriateness of a centralized mining town policy for such areas to a greater degree than elsewhere. In the north of the region the town of Moranbah (population 5000) is intended to become the service

centre for at least three mines. In the south of the region, the town of Blackwater (population 6000) services the workforces of three different mining companies. Toward the centre of the region, however, two mining companies with contiguous leases and projects initiated at approximately the same time (1977) have decided to build separate towns (detailed fully in Dedear, 1980). The background factors to this decision will now be briefly summarized before examining the extent to which benefits accrue to those towns providing a central location for the workforce of several separate mining projects.

Development of Separate Towns: Tieri and Middlemount

The decision for separate town development in this instance centred upon the following factors:

(a) at that time, 45 km had emerged as the most common assessment of the upper limit that unions were expected to tolerate under the (then Bowen Basin-wide) policy of no travel-time payments to mine employees. Furthermore, with employee tolerance of travel cost declining due to increased gasoline prices, unions were pressing for further concessions from the companies, such as provision of bus. No existing towns were within the 45 km vicinity of Tieri and Middlemount.

(b) both companies anticipated underground as well as surface operations and given the labour intensiveness of the former, travel times had to be minimized.

(c) there was a concern that a joint town would increase inter-company labour mobility.

(d) since both companies were at slightly different stages of project development, there was the issue of whichever company went into the town first would have been financally committed to the construction of the infrastructure necessary for the second company's workforce. The total cost of a joint town was estimated to be $74.8 million in 1977. The first company into the town would have been financially responsible for Phase 1 of town infrastructure, estimated at $47.7 million. That outlay would have been reduced to $39 million when and if the second company joined the town—a figure approximately the same as the estimated total cost to build an entirely separate town. The critical issue concerned the difference ($8.7 million) between the two figures for the initial costs which represented the extent to which the first company would have had to commit itself in anticipation of the second company coming into a joint town.

(e) if the Queensland state government was to implement a policy of fewer, centralized mining towns, it needed to become involved in the coordinated planning and funding of mining town infrastructure. The legislative machinery existed (through state public works and regional development acts) but the final constraint on such a role being performed was the government's policy that public money should not be used to provide services for what is essentially private company development.

The Advantages of Aggregation

1. It has been argued that a better standard of services and amenities (particularly those in the public sector which are linked to population thresholds) can be justified and supported by the larger populations resulting from the aggregation of the

workforces of several employers. Comprehensive medical and hospital facilities become feasible as do secondary schools. If the town achieves the size of say, Port Hedland or Karratha, tertiary education facilities can be considered. Parkes et al, (1985) have highlighted the fact, however, that many of the difficulties of public service provision in remote, arid-land towns are related not to the absolute levels supplied but to the quality and type of service available. Attracting qualified staff is a problem in the education and health areas.

They also point out that studies show that improvement to facilities, however desirable, will not solve certain fundamental problems which face most small mining towns. Problems such as racial tension, prejudice, alcoholism etc. are seen as being related to the political and social structure and are unlikely to be solved through palliative measures of improving the provision of services alone.

In the private sector, population size and levels of disposable income are taken as the two principal yardsticks by which entrepreneurs evaluate the viability of introducing a particular retail, recreational or commercial service. In the context of resource communities in remote or semi-remote locations, the prospects for additional private sector services and facilities depend on the extent to which income is spent within the town.

Dedear (1980) has studied this issue in the context of the town of Blackwater in central Queensland. Despite having a population of 6,000 and a role as a central town for the workforce of three mining companies, it has been found that the problems inherent in small, single company towns seem likely to prevail in Blackwater and the larger, multi-company towns in the central Queensland region. This seems to have arisen as a result of the high degree of connectivity with the coastal regional centres (250 km away) displayed by householders in the Bowen Basin mining towns. That connectivity, manifested in frequent trips and high levels of income leakage to the coastal towns, account for the under-supply of non-basic economic activities, reduced job opportunities outside the mining industry and low levels of home-ownership in Blackwater (despite company home purchase schemes), due to many households owning houses on the coast while renting company stock in the mining town. (Similar situations hold for the mining towns in northwest Tasmania.) In the future, increasing gasoline prices may give a slight boost to the commercial sector in Bowen Basin mining towns as the 250 km shopping trip may become too expensive for most people.

2. Combine towns are more likely to have a system of governance closely aligned to the traditional municipal model than a single industry town. It has recently been argued (Paget and Walisser, 1984, p. 101) that the form of governance has important implications for residents' perceived quality of life and the social vitality of the community by way of its influence on public participation, community independence, development efficiency and social development. For the most part, however, this constitutes an hypothesis awaiting some empirical verification, and with the move to normalization (local governance) of several Pilbora mining towns in the 1980s a basis for this examination is now available. On the issue of public participation, Sharma (1983, p. 161) points out that an 'open' town does not necessarily guarantee public participation in decision-making unless residents have voting rights/representation on the basis of their residency in the town, as distinct from their status as ratepayers (which most were not, in the context of towns such as Moranbah, where the company was represented on the local council). Furthermore, companies are relieved of the necessity of pursuing non-mining functions if conventional town administration is

introduced and home ownership by employees becomes general (Brealey and Newton, 1981).

3. The existing town infrastructure can be exploited in cases where it is possible to graft new workforces onto the populations of existing towns. (See the earlier argument by Johns, 1984). This has happened in the past at Port Hedland and is currently taking place with the location of the operating workforce of the Woodside Petroleum Development Pty Ltd. North West Shelf Development Project at the existing regional centre of Karratha. Parker (1986) points out, however, that resource projects located near an existing settlement leave much of the infrastructure costs to local and state authorities, providing as an example, the defrayal of costs achieved by Comalco by locating its aluminium smelter at Gladstone rather than at its bauxite town of Weipa. Costs to local government in particular tend not to be considered adequately at the time of negotiation between the state government and the company:

> "Ideally the approval of resource development projects maximizes the net benefits to both parties concerned. However, if the state government emphasizes state-wide benefits (additional government revenue, increased employment and economic growth) and overlooks or under-estimates local costs, the state government and developer may be gaining benefits from costs borne by the local community." (Parker, 1986, p. 114).

In the context of mining development in the Hunter region of NSW, Parker (1986) provides a detailed examination of the extent to which infrastructure for the resources sector was subsidized by the local community:

(a) by local governments' provision of infrastructure for resource development; and

(b) by local government expenditure being financed by local revenue sources (as opposed, say, to state government grants).

On the first issue, the town in question, Singleton, diverged from the rural benchmark pattern to one of significantly increased expenditure during the period of resource development (1976-1981), to the extent of $2,000 per Singleton resident over and above the rural benchmark figure (Parker, 1986, p. 158). On the second point it was found that rates provided $2.7 million towards the cost of development-related infrastructure (almost as much as the $2.8 million contributed by the developers), a fact which was reflected in Singleton resident rate levels being significantly higher than those in the benchmark shires, (Parker, 1986, p. 213).

Problems are compounded where several projects are proposed for the same period for the one region. Parker (1986 p. 95) points to a critical omission in the project evaluation process for combine towns in non-metropolitan settings being one of a lack of any evaluation of cumulative impact:

> Established towns often have excess capacity in physical and social infrastructure. An individual project can assume its workforce will be able to consume excess capacity without incurring extra costs. But if (several) projects are making similar demands, existing capacity will be quickly consumed".

4. More opportunities become available for alternative employment. These can result from the activities of the operating companies occupying the town or they can occur in the non-basic or service workforce which accrues to larger towns and broader-based development (Brealey and Newton, 1981). However, in the short run at least, there could be difficulties for the local labour market specifically related to the bidding up of wages in the regional economy (Anderson, 1984 p. 19), and a bleeding of labour from activities such as farming, local government, local services etc. (Parker, 1986, p.67) due to differential wage levels.

5. Economies of scale in construction costs become possible with a larger town and there is a better chance of sustaining a local building industry (Brealey and Newton, 1981). The problems here are again in the short term, where it has been common for lags of up to 2 or 3 years between the onset of development and a stage where the housing industry has geared up to higher rates of construction (Newton, 1982; Anderson, 1984).

6. The social and economic diversity of a combine town (as compared to a single industry community) is likely to have a positive impact on several quality of life measures: population stability, homeownership and social interaction (Brealey and Newton, 1981):

(a) Aggregated towns will continue to exist longer than single-company towns. Thus, they provide a setting for **long-term residence,** if that is what employees wish. Coupled with the wider range of job opportunities mentioned earlier, residents can anticipate that their children may continue to live in the town when they reach adulthood.

(b) A more favourable environment for **home ownership** is created where there is a large population working for a variety of employers. Setting aside, for the moment guaranteed buy-back schemes such as the one currently being offered at Hedland and Newman, there would be more opportunity for selling a house in a large diverse population than in a single company town. Consequently there would be less reluctance to buy a house.

(c) Expanded opportunities for **social interaction** become available. Residents no longer are constrained to socialize only with employees of the same company, which encourages the extension of the company hierarchical structure into the social fabric of the town. A larger population provides a broader spectrum from which people can select friends of the appropriate social status and/or having common interests.

7. A much wider choice of townsite locations becomes possible if a combine town is opted for rather than building a small, single-company town in close proximity to the ore body. The probability is increased of finding a site with suitable soil type and drainage, or topography which is more interesting or provides better protection from natural hazards. In some cases, if the nexus between the town and the mine is broken, it may be possible to accommodate the population at a seaside location as has been done by Western Titanium Ltd. at Leeman, which is 50 km from their inland minesite at Eneabba (Brealey and Newton, 1981). As Paget and Walisser (1984, p. 106) have noted, longer commuting distances can be tolerated if the commute is from a highly attractive, established community.

The Disadvantages of Aggregation

1. The inconvenience of extra travel time to the worker is the most commonly cited penalty of creating centralized, aggregated townships. In a previous report (Newton and Brealey, 1979), it was revealed that in 1974, 43 percent of workers in Australian capital cities spent more than 30 minutes on their journey to work, and the median journey to work by all Australian workers in 1974 was : 18 minutes (car); 57 minutes (trains); 34 minutes (bus); 11 minutes (pedestrian).

As the majority of workers in the new northern mining towns are recruited from urban centres throughout Australia, their journey-to-work patterns prior to recruitment are likely to reflect those of capital city workers. To test worker preferences for commuter mining, a questionnaire was administered to male workers at Leeman and Shay Gap regarding their preference for trading the advantages of living in a large town against a longer journey to work. They were offered three scenarios. The first required them to travel on their own time at their own expense, the second in free air-conditioned bus transport on their own time, and the third in free transport on company-paid time. The travel options were: living in a town with less than 1000 population (e.g. Shay Gap) and spending up to 15 minutes in getting to work, living in a medium sized town with 5000 population (e.g. Newman) and travelling 15-30 minutes each way; living in a large town with 10,000 population (e.g. Port Hedland) with travel time each way of 30-60 minutes; and living in a regional centre with 20,000 population and travelling 60-90 minutes to work.

The workers of both Shay Gap and Leeman (towns with less than 1,000 population) showed, for all three scenarios, a distinct preference for living in a medium size town of 5000 and travelling up to 30 minutes to work. Given the performance of modern vehicles and within the strictures of the state speed limit, this could fairly be translated into a road distance range of 40-45 km.

Brealey and Newton (1981, p. 214) point out that if the worker doesn't have to commute to work, there is a strong possibility that it will be his children who must, to attend high school by bus. Also, for those living in a small single-company town, it is frequently the wife of the worker who has to commute. (She normally undertakes the settling-in of children at school, taking them for specialist medical, dental or optical treatment, attending to family business which cannot be done in the town and shopping for items not available in local stores.)

As Paget and Walisser (1984, p. 106) illustrate, the perception of distance (or, more pragmatically, who commutes where and for what purpose) is likely to vary between the company, the employee and the residents of a resource community:

> "... community residents usually perceive distance as isolation from a variety of services; but community residents in the guise of workers perceive distance most acutely as distance from work".

2. The necessity for employers to provide transport is a financial burden which most urban employers are not faced with. However, most mining companies already provide bus transportation (including drivers) for their employees to travel to the minesite. If longer commuting distances were involved, additional costs would be incurred—both capital and operating, although such outlays comprise allowable deductions for company tax purposes.

3. Whose time the worker travels on must be a question for industrial negotiation. In the Shay Gap and Leeman commuting surveys, the prospect of paid travelling time attracted a higher proportion of respondents to the options requiring a 60 to 90 minute journey to work than the same options where workers travelled in their own time. Travel time payments to an underground workforce (which is estimated to be eight times more labour intensive per unit of output) could be prohibitive for towns located at some distance from the mine (Brealey and Newton, 1981).

4. Inconvenience to on-call personnel may be considerable where lengthy commuting distances are involved. This was one of the shortcomings reported at Leeman regarding the Western Titanium Ltd. mineral sands operation (Brealey and Newton, 1981).

5. Inter-group conflict can arise as a result of aggregating different populations. In small communities which experience rapid development after a period of stability or stagnation, two major axes of conflict can be identified which require attention: conflict between the newcomer and the established resident and rifts between employee groups which receive differential reward for, labour even though both are essential to the economic viability of the town's industry (e.g. employees of a major mining company versus service or ancilliary workers). The latter schisms have been identified for open towns such as Hedland in the Pilbara (Brealey and Newton, 1978), while the former problems are more common in settled regions experiencing rapid growth from energy development (Newton and Parin, 1983).

6. The loss of a tax base to the authority administering the town (because of not being able to levy industrial rates on the mine property) could be construed as a disadvantage of creating aggregated towns at some distance from the mine (Brealey and Newton, 1981).

Factors Predisposing Development of Fly-in Option

1. In the 1980s concern has continued to increase, both in Canada (Wallace, 1984, p. 108; Glass and Lazarovich, 1984, p.64) and Australia about public sector financing of infrastructure for resource development. It is now recognized that major mineral resource developments bring certain costs as well as benefits which tend to fall unevenly across the Australian economy, giving advantage to some region, while disadvantaging others. This position has been underlined by the Australian Institute of Urban Studies (AIUS, 1980) which revealed that a diversion of public sector funds to resource development in non-metropolitan areas was to the disadvantage of the majority of Australians located in the cities (through reduced levels of public expenditure on their own urban and social infrastructure).

The situation relating to provision of social infrastructure for resource development has changed markedly in the last three to five years, and the situation now is one where all state governments require substantial infrastructure contributions and commitments from developers (ACIR, 1984, p. 119). The contributing factors include:

(a) federal monetary policy having been directed towards constraining public sector borrowing in order to improve the access of private sector developers to investment capital and to prevent public sector borrowing from 'crowding out' private sector borrowing. (ACIR, 1984, p. 118).

(b) problems experienced by state governments in servicing foreign loans associated with a decline in value of the Australian dollar.

2. Technological advances in aviation and telecommunications have improved the viability of the fly-in option. Fly-in capability has been present since the 1940s with aircraft such as the DC-3, but has become increasingly viable since the late 1960s with the introduction of short haul (1600 km) jets such as the Fokker F.28 with 85 passenger capabity and cruising speed of 840 km/hour.

3. Long distance (fly-in/fly-out) commuter mining is an innovation whose origins, in Australia at least, date back less than 20 years. The innovators were the petroleum and gas companies, especially those linked to off-shore operations, who were required to pioneer this particular method in order to exploit marketable reserves. Diffusion of this system to on-shore mining corporations, like any innovation, takes time. There will be those who adopt the practise early and there will be laggards, with the individual mining company's perception of the situation, level of information about operational aspects and ability to evaluate outcomes, dictating the speed with which the innovation will be adopted.

Clearly, this is a subject demanding more detailed research than can be assembled here, but it would appear as though three parties are vital to the decision, namely, the mining companies, the unions and the workers:

(a) Mining companies in Australia had no indigenous experience of fly-in operations until ESSO-BHP's oil/gas exploration in Bass Strait in the mid-to-late 1960s. Not unexpectedly, therefore, the first on-shore fly-in operation was associated with exploitation of the oil and gas fields at Moomba, 800 km north of Adelaide (S.A.). Several recent mining developments proposed or underway in remote settings in Australia have links (through corporate networks) with mining companies that possess direct experience with fly-in operations such as Placer (Canada) in respect of the Kidston gold mine in northern Queensland; Delhi Oil Corp (USA) in respect of the Lake Way uranium project in W.A. According to Hayward (1984), Queensland Mines Ltd was influenced in its decision to adopt a fly-in operation for the Narbarlek uranium mine in the Northern Territory by the apparently successful operation of a similar system used by Gulf Minerals Canada Ltd at its Rabbit Lake Uranium mine. The pattern of interlinkage through joint ventures will increasingly encourage the evaluation and adoption of fly-in/fly-out as an option for development of on-shore non-renewable mineral deposits.

(b) A study by Veno Dufty (1985) sought the opinions of officials in the five major unions involved in mining in Australia in connection with long commute, short commute and on-site town options. They found that while the unions would be prepared to negotiate virtually any option, the clear consensus of opinion was in favour of 'open' towns involving a daily commute, followed by a company town option, with a long commute being least preferred. The interesting feature of the study, however, was the fact that one of the five unions revealed first preference for the fly-in/fly-out arrangement—and that particular union was the one representing workers involved in off-shore oil exploration. Clearly, familiarity brings with it a greater degree of acceptance of alternative arrangements.

(c) A series of studies commissioned by Ashton Joint Venture in connection with the Argyle diamond project indicated that workforce preferences were strongly oriented toward commuting (Rose et al. 1984, p. 1), although there have been no independent studies to determine the universality of this finding.

4. Australia's post-war mining boom has unfolded, for the most part, in relatively remote regions of northern and western Australia. Australia's aboriginal (native) population is more heavily concentrated in such areas - in small, dispersed settlements. In 1966, no Aboriginals owned land by virtue of their race, but by 1981 they held title to almost 10 percent of the land area of Australia (Cousins and Nieuwenhuysen, 1984, p. xvi). By 1985, under pending Commonwealth land rights legislation, 25 percent of the country's land surface is subject to Aboriginal claims.

The current federal government's land rights policy centres on five principles which it believes should be applied with consistency in all the states and territories:

- Aboriginal land to be held under inalienable freehold title
- Protection of aboriginal sites
- Aboriginal control in relation to mining on aboriginal land
- Access to mining royalty equivalents
- Compensation for lost land to be negotiated (Holding, 1984, p. 2)

These policies have not received support in the principal resource states of Western Australia and Queensland. In the Northern Territory, however, the Aboriginal Land Rights (Northern Territory) Act of 1976 provides, among other things, for traditional aboriginal owners to control mining and other activity on their land. Central to the agreement for the mining of uranium at Narbarlek, signed in 1979 by Queensland Mines Ltd and the Northern Council (who negotiated on behalf of Narbarlek Aboriginals), was the wish of the aboriginal people of the area that there be minimal impact by the mining operation on the local communities. The following requirements resulted:

(a) that no town be built in Arnhem Land,
(b) that mining and treatment be carried out within an 8 year period, and
(c) that all recreation time afforded the workers be spent off site.

According to Hayward (1984) these constituted the principal factors for instituting a fly-in program for this project.

In the case of Argyle, field studies (Rose et al. 1984, p.4) revealed that the local aboriginal population was not opposed to mine development, but there was concern expressed about possible adverse impacts which centred upon: damage to aboriginal sites of significance; intrusion on community life and in particular, conflicts over aboriginal women; exclusion of local aboriginals from improved urban facilities associated with any new town (which implicitly suggests that there would not have been a significant role for the local aboriginal population); and social disruption linked to increased access to alcohol. Under the terms of the 1979 Agreement, restriction of personnel to camps without access to private vehicles will significantly diminish the impact on the local community and the local physical environment. (The environmental impact statement for the proposed Lake Way uranium project in Western Australia advances a similar rationale for their fly-in program.)

5. For at least two of Australia's recent fly-in projects (Kidston and Argyle) company reports have pointed to significant cost savings associated with their decisions not to construct an on-site town to house workers and their families. In the case of Argyle, construction of a town would have added an estimated $72 million to the cost of the project, with the operating cost savings of, instead, being estimated at $1.8 million per year (Rose et al., 1984). For Kidston, the cost of constructing a town with acceptable levels of social amenity was contributing to the economic infeasibility of a project which had an expected life of about 15 years (Needham, 1985). Consequently, while the company (Placer Holdings) determined that the end costs of a new town versus commuter mining were of similar order, commuter mining altered the cost parameters from front end capital expenditure to an ongoing operating cost that is more equitably distributed over the life of the mine. As a result, mines that could not afford to commence because of high up-front infrastructure costs for a town, now have this option available.

6. Under the federal government's 1985 taxation legislation on fringe benefits, employers are taxed at the prevailing company tax rate in respect of subsidized employee accommodation, low interest loans for home purchase, subsidized power, employee annual leave, travel grants, etc. However, in situations where there is a requirement for mining companies to commute their workforce either daily from some regional centre or periodically from a more distant urban centre, the Income Tax Assessment Act provides for the cost of such outlays to be considered as allowable deductions associated with producing assessable income.

In evaluating the impact that this legislation is likely to have on the mining industry in Western Australia, Pilgrim (1986) points to the likelihood of a levy of approximately $25 million annually (on present levels of company expenditure) to iron ore producers in the Pilbara region—a region with a high concentration of single industry mining towns, where such incentives have been fundamental to labour recruitment since the upsurge of mining activity in the 1960s. The long-term settlement implications of this legislation are clear: it acts as a disincentive for establishment of settlement in harsh regions where it is necessary to provide a range of financial incentives to workers, and an incentive to employ fly-in operations from southern metropolitan centres.

The Advantages of Fly-In Programs

1. Canadian studies (Glass and Lazarovich, 1984, p. 86) indicate that it is generally easier to attract and retain skilled personnel for fly-in operations. The most recent labour turnover data for Australian fly-in projects indicate that this is also the case. Data for Narbarlek (1983/84) place labour turnover at 11 percent, down from 16 percent the previous year—and 51 percent in 1980/81., the first year of operation (Hayward, 1984, p. 15). Figures for Moomba have been 3 and 5 percent respectively for the years 1984 and 1985 (Morozow, 1986). These data more than favourably compare with data from new mining town (Brealey and Newton, 1980, Neil et al., 1984). The existence of burn-out due to work regime, an effect identified by Glass and Lazarovich (1984, p. 68), does not appear to be reflected in the turnover statistics at hand.

2. Fly-in projects afford increased flexibility to mining companies in respect of several major requirements:

(a) they represent an incremental style of policy-making that avoids big and expensive once-and-for-all-decisions (such as are associated with new towns construction) in favour of obtaining best value for money at each stage. Fly-in is not an intractable choice; it permits the option for a new town to be built, should circumstances change in the future. In the case of Argyle, the Agreement Act with the State government makes provisions for town development if it is found that the commute option is not acceptable to the company or workforce or especially if production rates increase in the future.

(b) development can proceed at a pace largely determined by the private sector (e.g. road access, a state, or in some instances federal responsibility, which has been a problem with projects such as Narbarlek). Fly-in overcomes the delay incurred while governments budget and plan for the provision of necessary public infrastructure.

3. Absenteeism of fly-in workers while on site appears to be extremely low—all have industrial nurse on site full time. Hayward (1984) indicates that the greatest 'cause' of absenteeism is a missed flight which results in an effective loss of one shift by those workers concerned. It is in the area of logistics that disadvantages accrue e.g. there is a need for overstaffing to cover for unplanned absences.

4. For families with children of secondary-school age, commuter mining presents an opportunity for one or more of the breadwinners to continue working in the mining industry while living in a location with facilities for secondary and tertiary education (as well as social and recreational facilities) and a wider range of employment opportunities. Douglas (1984, p. 17) asserts (in the Canadian context) that fly-in/fly-out attracts a special kind of workforce: married couples without children, or singles; and that workers with a family find too many problems associated with the absences from home. In the Australian context this remains a hypothesis for testing.

5. Recruitment is facilitated by being able to draw upon a metropolitan labour pool which can supply the bifurcated workforce characteristic of contemporary mining operations, namely, highly trained engineers and technicians and the semi-skilled and unskilled worker (heavily represented amongst the ranks of the unemployed in the large towns and cities). In all Australian fly-in situations, recruitment is undertaken over significant distances, generally within the state in which the resource is located, in order that economic benefits be captured by that state. This sees Argyle miners commuting from Perth, W.A. (2000 km to the southwest) rather than Darwin, N.T. (550 km to the northeast); Moomba workers commuting from Adelaide, S.A. (800 km to the south) rather than Broken Hill, N.S.W. (500 km to the southeast). Workers for the single industry towns, by contrast, tended to be recruited nation-wide (see Brealey and Newton 1980).

This practice tends to stand in contrast to Canadian fly-in operations, where several staging points are used—some from smaller centres in the immediate region—in connection with a single project, in an attempt to reduce what are perceived to be the negative 'fly-over' effects of long distance commuter mining. In particular, there is the potential for excluding the native population from employment in local projects (De Pape, 1984, p. 90; Robinson, 1985, p. 44), as seems to be the case in Australia—apparently a requirement of the local Aboriginal community in the case of Narbarlek; the motivating factors are less clear in other projects. For example, in relation to the proposed Lake Way project, Lancaster and Associates (n.d., p. 9-20) state that:

"The company has adopted a workforce management scheme which is designed to avoid interaction between the plant workforce and the aboriginal community. It is indicated that this will not preclude employment of local aboriginals; employment will be offered on an equivalent basis, that is, during the 19 days on there will be complete restriction to camp".

6. A recent report (Rose et al. 1984, p. 4) claims that a group of companies operating fly-in projects have significantly lower levels of industrial disputation than company towns—although empirical data and reasons for the difference in industrial relations performance remain to be explained.

7. Remote zone rebates on personal taxation are allowable for those persons who live or spend at least 183 days during the year of income within prescribed zones. This can facilitate tax savings of up to 40 percent in the case of married workers with a dependent spouse or 25 percent in the case of single workers (based on a gross salary of $A350 per week). Current legislation will permit this tax benefit to be enjoyed by those workers who may live in a capital city (e.g. Perth) and who commute for purposes of work to mine sites such as Argyle, Leinster, Newman, etc. Thus permanent residence in a remote mining town is not a necessary condition for special tax concessions.

8. As indicated earlier in the event of mine shutdown or closure, the impact is lessened for the company, government and worker when the operation is based on a fly-in system.

In as much as the fly-in option is of recent operation for land-based mining projects in Australia, there is an absence of studies which can confidently point to the benefits and disbenefits (but more particularly the latter) associated with this procedure - particularly those at the level of the worker and his family. At present, we can assemble data which indicate under what circumstances land-based fly-in operations have developed within Australia (see Table 1 below).

Table 1: Profile of Existing Land-Based Fly-In Mining Projects in Australia, 1984.

	Nabarlek, N.T.	Argyle, W.A.	Hidden, Q'ld	Roxby, S.A.
Resource involved	Uranium	Diamonds	Gold	Oil, gas
Year of commencement of operations	1980	1985	1985	1988
Expected life of project	10-12 yrs	> 25 yrs	15-20 yrs	> 40 yrs
Size of on site Operations workforce (Home location)	100 (Darwin)	400 (Perth) 70 (Kununurra)	190 (Cairns & Atherton region)	1300 (Adelaide and surrounding region)
Commute distances from source(s) of labour recruitment	300K (Darwin)	2200K (Perth) 100K (Kununurra)	350K (Cairns & Atherton region)	600K (Adelaide)
Roster (days)	17 on site 11 RAR	14 on site 7 RAR	7 on site (Award) 7 RAR (Award) 4 on site (Staff) 3 RAR (Staff)	15 on site 15 RAR

The data indicate that there is no uniform prescription for a fly-in project. For example, the regime can be associated with: projects having a relatively long (as well as short) life expectancy (counter to Glass and Lazarovich's 1984, p. 73 contention that fly-in/fly-out is not feasible for developments which are expected to continue for extended lengths of time); a variety of resources, with a tendency towards those with

a relatively high value to weight ratio; workforce sizes approaching 1500 persons, challenging the limits thought to hold for fly-in operations in Canada; (see DePape, 1984, p. 88); and commuting distances in excess of 2000 kilometers.

CONCLUSION

In the future it is clear that we will find all three settlement options employed in particular resource projects in Australia, although the frequency with which each will be adopted is likely to differ from that which characterised the past 25 years. Current indications (based on environmental impact statements submitted to government over the past 5 years) are that the fly-in option is being increasingly chosen as a means of accommodating a workforce associated with mining of non-renewable resources in northern Australia, and not simply for reasons of location (remoteness), scale or expected life of project. In addition to technological changes in transport and communication which have enhanced the viability of long distance commuter mining, evaluation of the appropriateness of this system for resource projects continues to be reappraised by government, mining companies and labour as to the advantage it confers over alternative systems of settlement. An extensive research agenda lies ahead in an effort to better quantify the benefits and disbenefits of each system. Meanwhile information exchange at mining company level (formally as partners in joint ventures or via more informal channels) is occurring which encourages exploration of all options. Likewise, diffusion of information concerning fly-in practices is occurring within the labour union movement, facilitating its future acceptance on a wider scale than previously. Perhaps the single most important influence, however, is linked to the manner in which governments assist the mining sector (either directly or indirectly) with the provision of infrastructure (especially social infrastructure) for resource development. We have seen how, in general, the pendulum has swung from a developmentalist position by federal and state governments in Australia in the 1960s and early 1970s to a position which now requires a greater level of privatization of resource-related expenditure. Furthermore, recent changes in federal taxation legislation have provided stronger incentives for mining companies to pursue combine town or fly-in options. Fly-in is emerging as perhaps the best means of minimizing outlays by government and mining corporations on social infrastructure.

In those cases where new single industry towns have to be built (as with Roxby Downs, S.A., 550 km north of Adelaide, where work has commenced on a town to ultimately house 9000 people), considerably more effort will go into preparation of Indenture Agreements compared to their earlier equivalents in the 1960s, (see review by Warnich, 1983) in order to obtain an equitable sharing of risks and benefits between company and government. The expectation is, also, that past experience will contribute to a better designed and managed community.

With the passage of legislation in 1983, there is now no longer any tax-related impediment to the development of centralized or combine towns serving deposits up to 65 kilometres distant from the workforce and their housing. (Moreover, future High Court action could see new, and more liberal treatment of the 'adjacency' provision in connection with new ventures.) Research has shown, however, that the benefits which accrue from a more diversified community are likely to be at the expense of the existing residents, unless planning is instituted to avoid the problems associated with rapid growth, designed to minimize the lags in provision of services and facilities and

attain a more equitable distribution of costs between newcomer and existing resident, company and government.

We can now expect that whichever option emerges as the preferred approach for a particular resource project will have done so as a result of a detailed evaluation of alternatives, with benefits and disbenefits being assigned, as clearly as possible, to the major parties involved in development.

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B. Towns, Wheels or Wings? - The United States' Experience

Kristi Branch

My task is to describe the pattern of resource development in the United States. I have chosen to focus on the 1960 to 1980 period, the most recent period of rapid development in the United States that paralleled the development of both Australia and Canada—during which time there was a feeling that the development was going to continue at a very rapid pace. I shall discuss the types of choices that were made in the United States between 'towns, wheels or wings?', and also talk a little bit about the problems that were identified as resulting from the choices that were made.

In the United States, particularly in the lower 48 states, the emphasis has been placed on the impact of resource development decisions on the local communities. To a large extent this is a result of the fact that in the lower 48 most of the development occurred within the context of an existing regional and community structure, and consequently did not involve the establishment primarily of new communities.

What I would like to do first is present a brief overview of the resource development that occurred in the United States in terms of its type and location, and to briefly characterize the communities in these resource areas for those who may not be familiar with them. Following this, I would like to describe five patterns of project development that occurred in the United States and discuss the choices that were made concerning the acquisition and provision for workers in those communities. During this discussion I will try to highlight some of the benefits and problems that accompanied these decisions. I have decided to concentrate on the lower 48 states partly because this is the area in which I have done most of my work, and also it provides the greatest contrast with the experience of northern Canada. Currently the projects that are going on in Alaska are utilizing the fly-in/fly-out pattern and I agree that it is a choice that is becoming increasingly important in those isolated areas.

Aside from Alaska, the United States really does not have areas which are as remote, isolated or have such harsh climates as those in many of the countries that we have been discussing, and that has influenced the need for bringing large numbers of workers. This has greatly influenced the decisions concerning design and staffing of the resource projects located in the United States. In general, again with the exception of Alaska, recent resource development has been located generally near existing permanent communities. With some exceptions, these communities have been primarily agricultural or ranching, sometimes mining-based communities that had a population that was mainly "anglo". The exceptions in the lower 48 are resource developments that have occurred on native Indian reservations or near Spanish land-grant communities in New Mexico. These have been in the minority although they have received a considerable amount of attention. Consequently, the focus of my discussion is on the inner-mountain West which is the area where I have done most of my work and where there has been extensive resource development of various types, particularly during the 60s and 70s. To a lesser extent that development continues today and many of the projects that were initiated during this period continue to operate. The area that I am going to talk about includes the area primarily east of the Rocky Mountains in the United States and it includes some of the Great Plains states, North Dakota and Montana, Wyoming, Utah, Colorado, Arizona and New Mexico; these are the areas that had a variety of minerals that were developed during the period.

LOCATION OF STUDY COMMUNITIES

During the 1960 to 1980 period, a whole variety a resource development activities took place in this area including hard rock and other mineral development, primarily mining but some milling, extensive oil and gas development, coal mining, uranium mining and milling, and hydro-electric projects. The communities in this area frequently had had previous experience with resource development. Many of them had experienced a boom and bust period prior to this recent development period but many of them had been stable or declining in population for a number of years. In general, these communities were both physically and socially conservative. They were fairly long-established communities for the United States and had population densities of the areas in which they were located of 2 persons per square mile—not nearly as low as some of the areas that were discussed earlier.

In general, the choices employed in the U.S., particularly in the inner-mountain West, took advantage of the existing regional settlement structure and they emphasized the use of daily commuting from host communities or communities nearby, either by car or by bus. They also, in some cases, emphasized the in-migration of workers and their families to the host communities nearby. In some instances there was an emphasis placed on providing work camps for singles and also for married couples who would commute weekly to areas that were located further away from the host community. In a few cases, not very many, new towns were established to provide for both the workers and their families.

In general, these decisions were made without the active participation or policy guidance of the federal government, and to a large extent, particularly during the 60s and early 70s, they were also made without specific guidance from the state governments. It was not until the middle to late 70s that the state governments in this inner-mountain West area had developed policies that influenced the location of new settlements or restricted location of company-located housing into particular areas and made a specific effort to control that kind of growth. Indeed, during this period attention was given to the issues created for the workers in the host communities by these projects only after the problems of the early boom town communities made newspaper headlines and created local and regional political pressure. Everyone in the United States heard about Gillet, Wyoming and all of the problems that were occurring there and it was really only after some of the early communities had experienced the kinds of problems that emerged that attention was given to the need to address the problem of acquiring and providing for the workforce on these projects.

In this area, five patterns of projects can be identified, each of which created different problems for the resource company in the host area. The first is when a single project with a moderate workforce was located in an area with a workforce that remained relatively constant over the construction and operations period. An example of this is the Westmoreland Mine in Montana. In general, coal mines utilize about the same size workforce for construction and operation. The problems created in this instance generally have been on the question of who will get the jobs. The Westmoreland Mine, for example, was located near to both the Crow and the Cheyenne Indian Reservations and consequently created policy questions about allocation of jobs and training to native Americans. Because the size of the workforce required for this project was small, generally speaking, the workforce was able to commute from existing communities with relatively little impact on the host communities. There are number of examples of this type of pattern in the inner-mountain West.

The second pattern is multiple projects each with a moderate workforce during construction and operation phase so that the workforce level remains relatively constant. Sheridan, Wyoming is an example of this type of pattern which had the location of multiple coal mines in the vicinity of this community. It was an existing community and had been a ranching community and a retirement community. The problems that arose in this particular case related to the ability of the community to expand its infrastructure to provide housing for the workers that were commuting on a day-to-day basis from the community to the mines and, to a large extent, the reason why this project occurred was an interjurisdictional problem that the mines were located in Montana and were consequently paying taxes to Montana, whereas the workers were located in Wyoming and were utilizing Wyoming services. That problem remains unresolved. In this instance, the workers were acquired from the local labour shed and also from in-migrants to Sheridan and to some of the communities nearby.

The third type of pattern is single or combined projects which have a large construction peak followed by a relatively, substantially smaller operations-level workforce. Colstrip, Montana is a good example of this, as is Wheatland, Wyoming. The Alaska pipeline is an example of a project like this. In Colstrip there is a multiple unit power plant and a large coal mine which has resulted in numerous labour force peaks in the area as each of the power plant units were being developed. This type of pattern creates substantial problems in terms of workforce availability and also the housing of the construction workforce in a manner that will allow transition to operating levels. There is also a substantial concern with these types of projects that

the local community will be completely overwhelmed during the construction phase by the large influx of population. In Colstrip, essentially a new town was created by the project and required careful attention to the design of the project so that it could make the transition from the construction workforce to the operations workforce.

In this case the company encouraged workers who were coming into the project, particularly construction workers, to locate in surrounding communities. There were a couple of communities that were within 50 to 60 miles of the project site and also they developed a work camp for single workers and also encouraged married workers to come and stay at the camp and commute on a weekly basis to areas further away from the project.

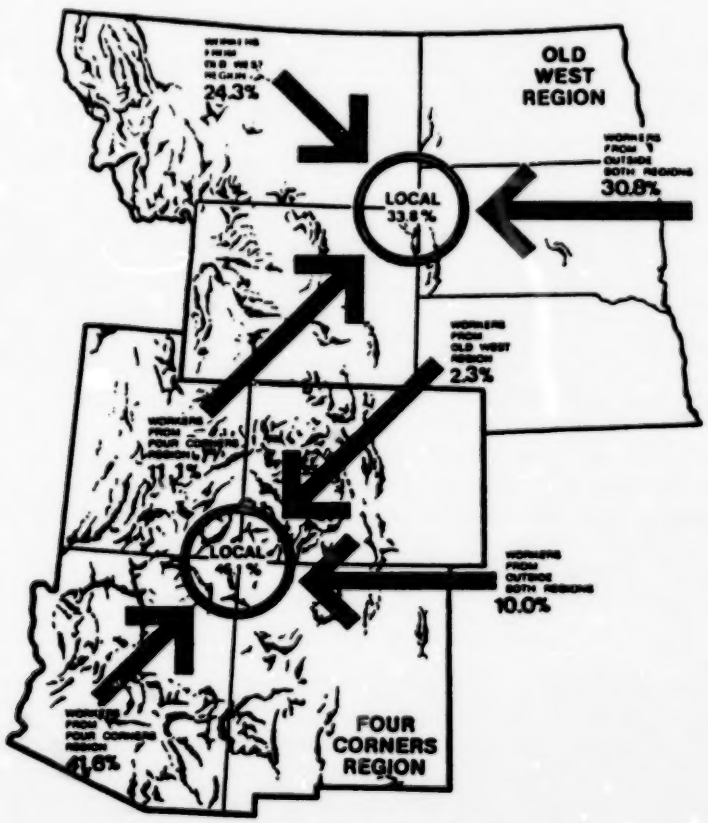
Colstrip is also a project that is located near an Indian reservation, the Northern Cheyenne Reservation, and in this instance again there were issues about who was going to get the jobs and expressed interests on the part of the native Americans who received training and received access to jobs. One of the additional actions that was taken to facilitate this was to provide a bus that went on a daily basis to pick up workers from the Reservation and bring them into the project area. But by and large the emphasis was on the in-migration of workers and commuting from nearby areas.

The fourth type of pattern is multiple small projects where the culminative construction workforce is much larger than the long-term workforce and examples of this occurred in Wyoming, Montana and North Dakota with the rapid development of oil and gas, where you had large numbers of small projects being located simultaneously in the same area. In this instance, there was a real problem in terms of having any ability to forecast how many people would be in the area and how many workers would be needed. There was a problem in coordinating many of the responses; and there was a problem in estimating what the long-term demand would be based on what was happening. (In general, the emphasis on oil development dropped off before any real solution had been developed.) This created some of the worse social conditions in the inter-mountain West (when these projects were operating) because generally the workers were on their own in terms of finding places to live, and there was no coordinated effort to provide social infrastructure services to them. One of the things that was done in Colorado was for an inter-industry task force to be formed to try to provide better information to the community about what their demands were going to be for workers and to provide a coordinating body to organize some response.

The fifth type of pattern is when you have multiple, large projects, some with high peak construction workforce requirements that create extreme demands on the local community. Examples of this are Gillett, Wyoming where there were a number of coal mines and power plants being constructed simultaneously and in sequence, Douglas, Wyoming where there were power plants, oil and gas development, uranium mining and milling, and a proposed, major synfuels plant. The population of Douglas, by the way, was about 2,500 people at the time when these activities began. Another example was in Colorado in the oil shale region. The problems here were the same as were identified with multiple project, combined towns in Australia where you have more than one company that is being asked to provide assistance to communities or solve problems and there is an issue of who should pay and whose responsibility is what.

In addition, because these projects were frequently of different types and were responding to the practically frantic activity of the mid-70s, there was a real question

about the magnitude of development that was going to occur in these communities. The forecast was for more and more projects to be located in this area. At the time there really was a question of whether there would be an adequate supply of local labour for these projects. Typically in the inner-mountain West, the projects tended to be scattered out over a large geographic area although in many cases as you can see from these patterns, many of them were clustered together in regions. With the potential for the development of oil shale and the continued forecast for increased demands for electricity, there developed in the late 70s a real sense among the companies that they were going to have a difficult time recruiting workers which was something that had not been a problem before. Attention had been given to the need to reduce turnover and provide adequate facilities for workers. During this period, apparently because of the accumulation of these projects, there was increased emphasis on the development of work camps in these communities. Also there was quite a competition in terms of who was going to have the most attractive work camp and who would, therefore, be able to attract the most workers. But, again, the feeling was that the workers would come to area on their own and the problem was more about how the community was going to deal with having these additional workers and the additional activity that would occur in the area than the problem for the project of obtaining workers to work on the project. In this fifth pattern, a new town was being proposed as a collaborative effort among the companies. At that point the oil prices fell and all of the projects were cancelled. Nothing came of that.



Construction Workers by Region of Previous Address

Just as an example, there was a survey of nine large construction projects that took place in 1975 when the big energy development was just getting underway in the inner-mountain West that covered this inner-mountain region and in the northern part of the region, including Wyoming, Montana and North Dakota, basically all of the workers were either located within the community or were commuters. To give you an idea of where the workforce came from in the northern part of the region, 33% were local residents who were living in the same community that they had lived in before getting the job on the construction project, 24.3% came from somewhere else in that region, 11.1% had moved in from the inner-mountain West states in the south and 30.8% had moved in from outside of the region. But all of the workers had moved within, primarily, daily commuting distance of the project.

In the lower part of the region, the Four Corners part of the region where there were some major generating facilities built, the patterns are quite similar. The local percentage of the workforce was 46.1%, the number of workers that had come from elsewhere in the region was 41.6%, those who had come from the northern part of the region were 2.3% and 10% had moved in from outside the inner-mountain region. Thus apparently these numbers not only indicate the patterns that were used and the decisions that were made in terms of 'towns, wheels or wings?', they also indicate the similarity of the workers on these projects with the local residents, which is another feature that has important implications for the impacts of these projects on the local community.

In the United States as a consequence of these types of patterns, the major emphasis and the problem area that was identified was on the construction period for the project. Generally speaking, the feeling was that the communities would be able to expand adequately to provide long-term services to operations workforce, and it was when you had large peak construction workforces that were only going to be present in the community for a short period of time that real problems were created.

The other question that was asked with the new towns that were built was how the transition from being companies towns to being incorporated communities would take place. In all of the instances, the community had an intention of transferring responsibility from the company to the community residents. In Colstrip—actually, I do not know whether Colstrip has finally incorporated or not—there were a number of votes about incorporating; the company was very interested in having this community incorporate but the community was obviously dragging its heels.

Another problem that results when you have the opportunity to have workers commute to the project area is speculative in-migration where you have a large number of people seeking employment, coming to the area prior to obtaining jobs. This was a very big problem in Fairbanks during the pipeline construction and to some extent this type of problem also occurred in Colorado and Wyoming during the period when many projects were being proposed, particularly when the slow-downs started to occur.

The other question that affects these communities is how to assure the long-term viability of these resource communities. Even in instances where the community has expanded moderately to accommodate the operations workforce and has not had to make the adjustment to a large construction workforce to an operations workforce, the communities in many cases are substantially larger than they were prior to the introduction of the project and, as with all non-renewable resources, there is an

expectation that the project has some definable life. Thus there is a real concern in these communities about how they can diversify their economies so that they will not be so adversely affected when the project concludes.

As I mentioned at the beginning, I think that the situation in the lower 48 is substantially different than occurs in the more remote regions of northern Canada, Alaska and Australia. Consequently the problems have focussed on what you do with your workers when you get them, rather than how you are going to recruit them and get them to the project area. As I mentioned, I think that development in the isolated areas of Alaska does appear to be emphasizing the fly-in/fly-out option increasingly. Recently, for example, a decision was made on the Susitna project which had originally planned on establishing a permanent community at the project site to, instead, flying their workers in and out and to providing local bus commuting so that residents in the project area would still have access to the project.

RAPPORTEUR'S REMARKS

THE HONOURABLE JUDITH EROLA

The mining industry has always been my first love, for a number of reasons. Of course, I was born in the shadow of a headframe, but also because I think that the camaraderie that exists in the mining industry is quite unique, particularly in Canada. It is a very small, warm, and sometimes fractious family but we share common goals.

I remember coming to Vancouver shortly after my appointment as federal Minister of State (Mines) to visit with some of the mining people in this part of the world, to be met by a local reporter who pestered me incessantly as to the wisdom of having appointed a women in what he called 'a macho post'. I was extremely patient with him but I finally lost that patience when he said, "Now what in heaven's name would you know about mining?" and I said, "A hell of a lot more than you do, honey." And that was the headline on the page the next day. I was never asked the question again. About a year and a half after the Mines portfolio, I was also made the Minister Responsible for the Status of Women, and then the question that followed me for about six months was, "What are you doing with two such conflicting portfolios?". My answer to that became standard, "It's easy. The Minister of Mines and the Minister responsible for the Status of Women have to become accustomed to a lot of shafting".

It is hard to believe that the conference has lasted for two solid days. We have covered so much territory. I will not attempt to do a précis of every presentation but perhaps to pull together a general sense of what has happened here and to make some comments from an ex-federal politician's point of view. And, if you see a bias coming through, I do not apologize for it. As I said to someone who objected to the NFB film that was shown yesterday, I am always more comfortable with the expressed bias than with the subliminal bias.

I would like to also comment for a moment on the role of the conference Rapporteur. I was telephoned this morning by the CBC in Prince Rupert and asked, "What are you doing at this conference?" I said, "Well, I have been asked to be the Rapporteur". And they replied, "What does that mean?". I explained that I was going to be <u>wrapping</u> it all up, as it were. The reporter exclaimed, "Oh, do you spell that

with a 'W'?" So I suggest to the Institute for Research on Public Policy that perhaps they change the spelling of Rapporteur. . .

I come from perhaps the mining community in Canada that has experienced with great joy and great despair the boom and bust cycle that is part of life in a mining community. Sudbury enjoyed peak period of employment around 20,000 - that is big time. It is now down to 7,000 and the downscaling has been extremely painful, although not without some spinoff benefits. One of our opening speakers yesterday referred to the classic mining company town. It was a bit of a wound for me because those of us who grew up in mining company towns know "in spades" the downside of that kind of a town where life is very stratified. In the Sudbury area perhaps more than any other community, where you lived was determined by the company and that determination was based on your ethnic background. The Poles lived in one centre of the town, the Italians on another side of the town, the Finns were in yet another, and there was very little mixing. Needless to say, they also had the toughest jobs to do! That kind of a mining town has produced a very militant kind of trade unionism that has affected, and in many ways afflicted, the area from whence I come. But because it was such a large development—and in my travels around the world I began to appreciate just how large—it also created tremendous expectations in the minds of those in the community who were planning community development, and also in the minds of the workers. It resulted in extremely rich benefits packages for workers and created an incredible dependence—a dependency that borders on a colonization mentality and it in itself stultified the development of a community spirit and the development of its people (people unprepared to look at other forms of employment, who were not prepared to look at handling their own mortgage). This was clear when the town finally became incorporated, when all of the vestiges of the company town left. It was proven to have been extremely traumatic to many of those people who, second and third generation, had never lived in anything but a company house. But this kind of mentality had a more far-reaching affect on the entire area because the work force was never interested in any other form of employment. Why would they be? Where else would you get the kind of job that paid that kind of money, the kind of fringe benefits they had, from company housing to expensive medical packages? So there was really no incentive built-in for the workers and their families to do anything about their situation. Then when the layoffs came, the problem of 'where do we go from here' was extremely acute. And the downsizing of expectations—and I mean the expectations of individuals and the expectations of officials—was extremely difficult. Someone asked me just a moment ago, "how are things now?" and if I were to say to you, "terrific", I would not be telling you the truth but they are not really terrible either. What has happened is that Sudbury is over the worst of it and the town is now beginning to diversify and people are beginning to recognize that small perhaps can be better. And, that "many smalls" will diversify the economic base of an area and provide a stability that does not exist in the boom and bust mega-project.

Why do I use the Sudbury area as an example? Because time and time again I have heard at this conference that the mega-project has been the economic salvation of the country. Well, I suggest to you that it has also created one of the major problems within this country beginning with the railroad that we needed so desperately. Until recently, Canadians have not been interested in working or seeing the development of anything less than a mega-project. If it is not a mega-project, is it really worthwhile?

On a recent trip that I made to Italy, I was struck time and time again by the number of small villages and communities, town after town after town, by the number of small manufacturing projects perhaps employing 20 to 50 people. Each in pursuit of excellence! That diversification, the pride-in-workmanship, and the productivity now reflects in a country that is enjoying an unprecedented economic prosperity. I suggest that downsizing of expectations is something that the Canadian psyche has not yet been fully prepared to accept.

I think that it is beginning to happen in parts of the country. It is beginning to happen in Sudbury. I say with some amusement that it is beginning to happen because during my tenure as a Member of Parliament for that area I tried very hard to stimulate diversification, and one way was a major science centre. I am going to give it a little boost right here; it's wonderful and worth seeing! At the beginning, it was not regarded highly by the citizenry because they could not foresee the economic spinoffs of having a major tourist attraction. Sure, you are going to create 300 construction jobs; what happens after that? They did not find the service industry particularly attractive; restaurant jobs—what are they; are they real jobs? The mentality again refused to accept the fact that unless you wore a hard hat, carried a lunch pail and had a good union contract, it was not a real job. Now, I report with some satisfaction the building of 3 or perhaps 4 new hotels in that area, and the subsequent job creation is now beginning to take hold. The area is beginning to realize that these are indeed real jobs and they are lasting jobs and that economic diversification can occur.

I must say also that the 'small is beautiful' concept, which was so difficult for them to accept, was one that troubled me in terms of the use of apprentices. That was touched upon in our discussions yesterday. The apprentice who finds himself out of work one year before he has reached the required amount of training time. That was happening in our area and it is a terrible drain on the workforce in general in Canada. One of the smaller Sudbury companies came to the government and using the DRIE incentive program developed 2 new expansion projects. He is now employing something like 200 people and almost all of them are the young apprentices who were laid off from the mining industry. That I consider a "small" success story but it could not have happened without a good deal of government assistance through an ILAP designation, through the DRIE incentives that were not "bailouts". They were incentives, using the taxation system and the levers that were available to federal and provincial governments to set up an industry that made use of those trained workers in that area.

Something that was not touched upon today is the brain drain of these communities. Mining communities, someone mentioned it earlier, are good places in which to grow up. I think you will all agree that those communities have provided a stability and an education that produced a pretty hardy bunch. We have heard from first and second generation mining people here today. As I cross the country I meet professional people, chief executive officers of many companies, I could name drop if you like—yes, I will—the Demarais and the Campeau's come from Sudbury! Some of the leading entrepreneurs in Canada have come from mining communities. What would have happened if many of these people had had an opportunity to develop their own communities? Not much of that happens in the company towns in Canada. Those kids go on to other ventures, in other towns. Part of it, of course, is the immigrant dream, "my kid isn't going to work in the mine; he's going to be a professional and leave this area". However, many of the children would very much like to have stayed in those

communities. But because they were single industry towns, there was no opportunity for them to return with the skills they had developed in the universities in the larger centres.

One of the problems of the single industry town is that 1% figure that was referred to yesterday by Peter Oberlander and Don Detomasi, that 1% figure, 150 communities if you like, spread right across the country: is the lack of political clout. An illustration of that is the situation where some 400 workers were to be laid off from a refinery in Montreal, just recently. What kind of political heat has that generated? Enormous political heat. And yet the entire town of Schefferville was closed with not nearly as much political heat. We have seen towns across the country closed with very little political concern generated. It has been a one shot thing, or perhaps even two shots on national television, but certainly no concentration of media attention. The fact of the matter is that when you close a town in a remote area, you are not likely to lose a seat in the legislature or Parliament. You may lose 400 or 500 votes, at the most 1,000, but not enough to tip the balance. When you start fiddling with industries in major centres, you find that the political heat is generated throughout a much larger political area and action has to be taken.

Also, we have to consider the federal-provincial jurisdications. It is a "but not my fault" syndrome that takes place. When a town closes within provincial boundaries, it is a provincial responsibility essentially, although the federal government picks up the tab in terms of unemployment insurance and lately through other programs. That conflict of jurisdiction or that split of jurisdiction has been an easy "out" for far too many governments and I am always reminded of the word 'governments' because it is a Canadian habit to say 'the government' and unfortunately, that is not the case—I say unfortunately because not having one government in charge has resulted in this kind of helter skelter approach and last minute planning. Closures that could have been averted if there had been a great deal of advanced planning, the kind of advanced planning that is available to a unitary state. We had the opportunity during the 1980s when I took some industry people with me and mining officials both federal and provincial, on a tour through the Scandinavian countries to see just how they coped with this very problem. It was very clear that their government structure made it much easier for them to say, "this is what is going to happen". For instance, in Finland and Sweden, we found that parallel development was in place the day the first shovel went into the ground in a mining community. The finite business of mining was recognized early and they were able to tell, given the economics of the situation, accurately enough, the life expectancy of the ore body and the point at which they would have to start re-training their people, and developing another industry in that area. It has been extremely successful. That kind of planning has not taken place very much in this country. I feel that through a meeting such as this, through the work of Dennis Young's organization, the Canadian Association of Threatened Single Industry Towns, which we hope will generate some political heat; through federal-provincial meetings at which some enlightened leaders such as the Honourable Wilson Parasiuk, will be able to put this situation on the "front burner". When I say the front burner, not just the Mines ministers' meeting—and I am certainly not belittling the effect of the Mines ministers' meeting because I think that such meetings have brought us to this stage—but the problem of the single-resource town has to be dealt with at a First Ministers' meeting. It must be on that agenda and we must get some cohesive policies in place to deal with the kind of planning that is necessary to take us into the year 2000, and beyond.

Bob Keyes, from the federal department of Energy, Mines and Resources laid out some interesting options for us—discussed in the government's recent publication on new financial mechanisms for addressing mining community problems. My fear is that finance ministers and their various ministries will nit-pick the proposals to pieces unless they are given a national priority. That national priority won't happen until the issue hits the agenda of a First Ministers conference. So I suggest to the people in the industry here and to those from academia that you start pushing and prodding for a place on that agenda.

Thus far we have discussed one industry communities that are faced with shutdowns. Now let us turn to the other half of this conference, wheels or wings? I am going to be the devil's advocate for the next little while. I sense an almost overwhelming enthusiasm here for the fly-in/fly-out system and it obviously has its advantages. Certainly they were spelled out to us very clearly. But a note of caution was sounded early in the discussions by Denis DePape. He used the word "trendy"; I would go even a little bit further to ask, "Is it a quick fix?" . Are we as Canadians about to say that parts of this country, the most remote parts, are not really very important? There is the very fundamental question of development, of sovereignty, that I think must be addressed. I think of Cominco's operations out on Little Cornwallis Island and the wonderful Canadian flag, that symbol of Canada in the North. Do we really want that to disappear? I think not. I think that the danger of going all out for fly-in/fly-out commuting, as practical as it is for the remote areas of this country, is one that we should examine very carefully before we embrace and endorse it completely. We really have not looked at some of the negative effects on the native community.

I could not help but smile as I listened to the discussion that was given to us earlier by Professor Hobart and a phrase that he used and how it connected to another conference session. In fact the words were exactly the same as in the film and discussion led by Diana Ellis yesterday referring to resource towns—"this is no life for a woman". The same words were used by the Inuit woman and the white woman in the film. The impact of these fly-in/fly-out operations on native peoples really has not been examined from the women's standpoint.

We have not, during this conference, given real thought to the role of women (workers) in the fly-in/fly-out operations. I do know that some of the human resource people in the industry have been talking about it. I did have an opportunity when I was in Tuktoyaktuk to talk to some of the native women in that community who had some rather bitter words for the resource companies. They felt that the resource companies came in, were very quick to employ the men and train them, but were very reluctant to do so in the case of the female natives. And when they did, that training was at a relatively low level with no opportunity to participate in training programs that would bring them up the ladder.

Also in terms of the fly-in/fly-out operations, we had a very interesting discussion yesterday afternoon about what was happening in Newfoundland. The "family adaptation to offshore commuting" and the presentation by Diana Ellis on resource towns were really very closely linked. As we found out, the oil rig operations' fly-in/fly-out had a very definite effect on families, and the jury is still out on what the eventual impact will be on families. Correspondingly, I ask, in terms of the native community, what really does happen when the native husband (man) leaves the community for six or seven weeks; or perhaps for two weeks? What happens when he

becomes exposed to another culture, begins to speak another language, while his wife and his family are left behind in a community with no access to that development? What is the eventual impact of that kind of a situation. Has anything been done to bridge these two worlds? May I suggest that while we all embrace the preservation of native culture, that we do a great deal more consultation with the native women themselves. From my discussions with them, their aspirations are not that different from the aspirations of women this side of the 60th parallel—ot only for themselves, but for their children. They want their children to be able to compete, to work in society at large, and I am not so sure that this will take place without the development of more communities and more facilities in that part of the world.

I feel very strongly that while the economics and certainly the best studies of the day—in terms of the environment, in terms of the social, economic impact on native people—indicate that the fly-in/fly-out operation is the most viable, it is to be approached with some caution and even greater study. I do not think that we should look at it as the "only way to go".

I hope that this conference will stimulate further discussion, I hope it will sound the right cautionary note in terms of fly-in/fly-out operations, and that it will serve to spur on those people who are working very hard to bring resolutions to some of the age-old problems that have plagued the single-industry town.